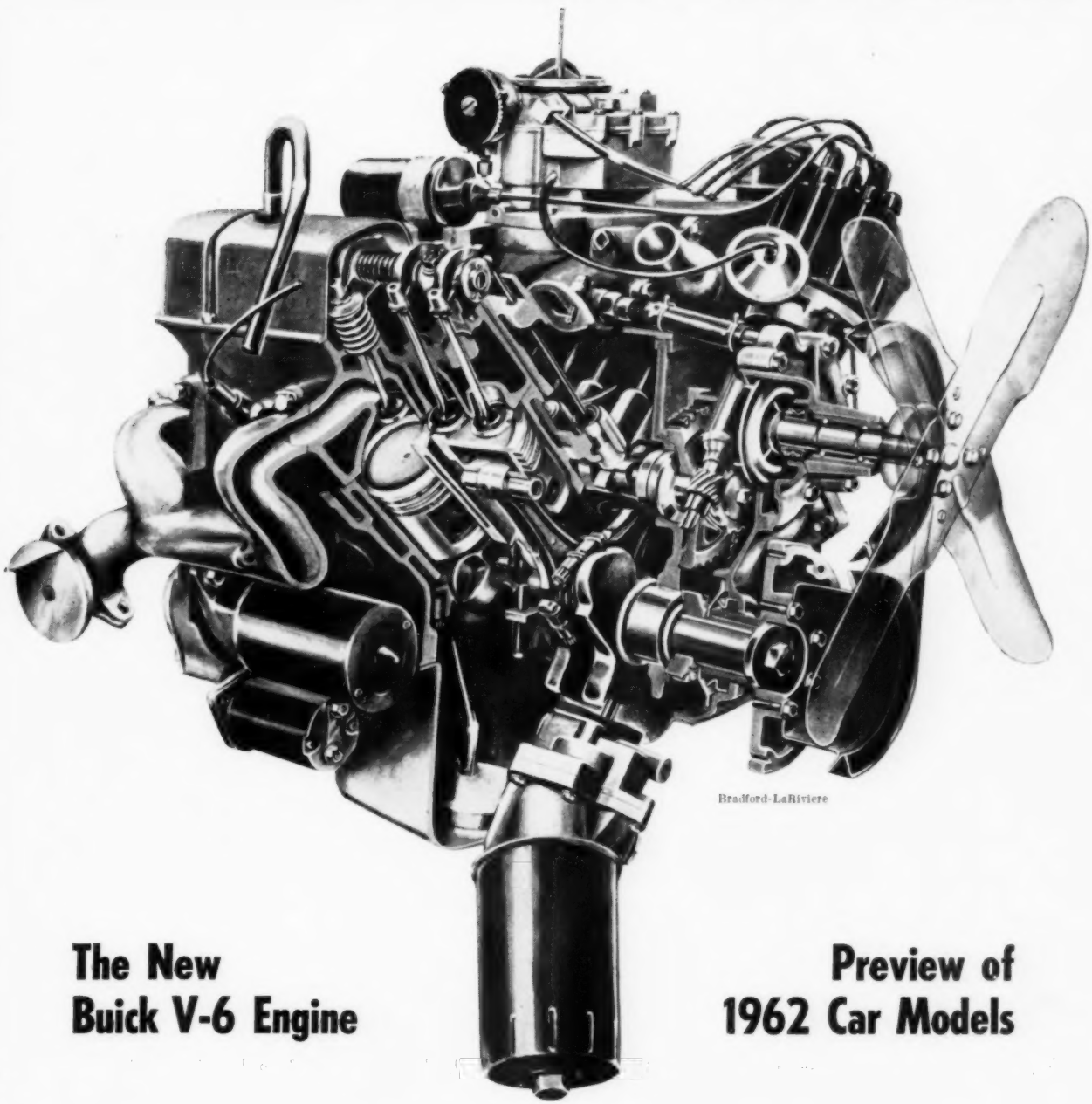
OCTOBER 1, 1961

AUTOMOTIVE INDUSTRIES

ENGINEERING · MANAGEMENT · PRODUCTION · DESIGN

A CHILTON PUBLICATION



Bradford-LaRiviere

The New Buick V-6 Engine

Preview of 1962 Car Models

minute particles of lead...

improve surface finish

On these center aligning balls used in automotive universal joints, CHARLESTON METAL PRODUCTS switched from A.I.S.I. 52100 to the same grade of steel *leaded.** They now report improved surface finish . . . a 15% increase in tool life . . . more uniform tolerances in finished parts. They also note that wear and shock resistance are not affected and uniform high hardness (RC 62-63) is maintained. Distortion remains at a minimum.

Results like these are not at all unusual when users switch to free-machining Aristoloy lead-treated steels.

For complete information about Aristoloy *electric furnace* bars and billets—call your local Copperweld representative or write today.

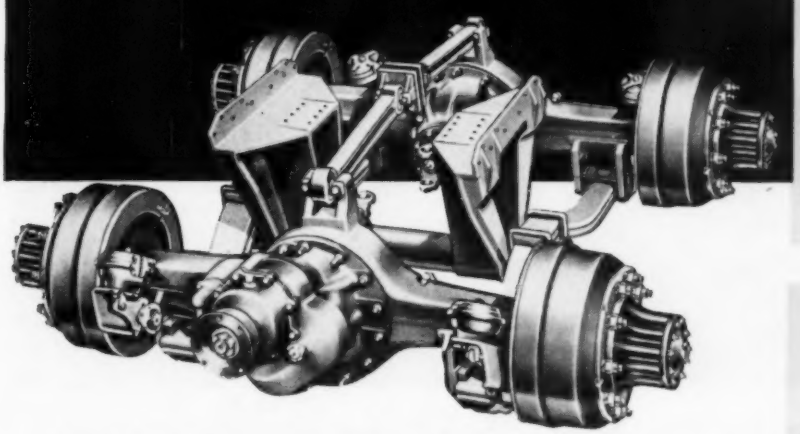
*Inland Ledloy License

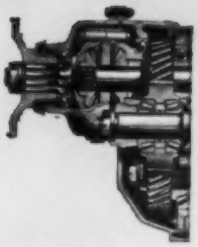
ARISTOLOY STEELS
DIVISION OF
COPPERWELD STEEL COMPANY

ARISTOLOY STEEL DIVISION 4025 Mahoning Ave., Warren, Ohio • EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N. Y.

MORE THAN 200 MILLION EXTRA TON-MILES OF PAYLOAD IN JUST 5 YEARS

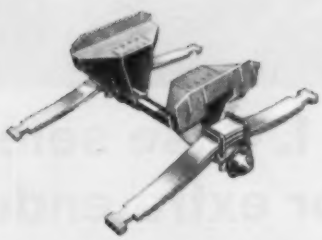
WITH ROCKWELL-STANDARD LIGHTWEIGHT TANDEMS





Driver Controlled Inter-axle Differential. Allows differential action between the axles to compensate for worn or mismatched tires . . . both axles do equal amounts of work. Can be dis-engaged at any speed giving positive thru-drive when better traction is needed.

Stronger Gear Sets. Hypoid gearing provides up to 30% more strength than spiral bevel gears of the same size. Modern hypoid design allows larger and stronger pinions with greater tooth contact area . . . assuring top efficiency and long life.



New Suspension Pushes Tandem Weight Savings Over 1000 Lbs. Rockwell-Standard's "taper-leaf" springs coupled with the latest in balanced suspension system designs is up to 434 lbs. lighter than comparable units. When combined with the payload advantages of the Lightweight Tandem you can save more than 1000 pounds per trip. This means thousands of ton-miles in extra payload per year.

In the five years since Rockwell-Standard introduced their Lightweight Tandems, thousands of users have rolled up millions of extra ton miles of payload. Check the superior features illustrated at right. They are some of the reasons why these axles are first choice with over-highway operators:

Plus these additional Rockwell-Standard advantages:

- In-line drive reduces wear on working parts
- High degree of parts interchangeability
- Large selection of gear ratios
- Torsion-Flow axle shafts
- Wide range of capacities – 8 models from 22,000 to 44,000 pounds

Another Product of... **ROCKWELL-STANDARD CORPORATION**

Transmission and Axle Division, Detroit 32, Michigan

J. I. Case selects two nickel-moly steels for extra endurance in power-train parts

Time is money to the farmer, especially during busy seasons when tractors are on the job from dawn to dark. This Case Model 830 is built to take the long hours of work, year after year, and keep costs *down.*

One reason Case tractors are rugged: Case engineers specify carburized and hardened AISI 4817 and 4620 to provide high strength and toughness in gears and shafts. Here's where:

AISI 4817 (3½% Ni, .25% Mo) is used for the most heavily stressed transmission gears. Readily case carburized and hardened to 60-62 R_C, 4817 develops an extremely strong, tough core to back up the case. With this combination of properties, components handle highest tooth loads, resist spalling, and take impact in stride.

AISI 4620 (1.8% Ni, .25% Mo) is used for spiral bevel pinion and gear in transmission. Specs for these parts require a 60 R_C minimum case hardness plus adequate core strength and toughness to resist impact, fatigue, and torsion.

When you order or design power-train parts, remember that nickel alloy steels provide combinations of properties that mean long, dependable service. For engineering data to help you select the best material for specific applications, write to Inco. We'll be glad to help.

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street INCO New York 5, N. Y.

INCO NICKEL

NICKEL MAKES ALLOYS PERFORM BETTER LONGER

AUTOMOTIVE INDUSTRIES

A CHILTON MAGAZINE • PUBLISHED SEMI-MONTHLY

OCTOBER 1, 1961

Passenger Cars • Trucks • Buses • Aircraft • Tractors • Engines • Bodies • Trailers • Road Machinery • Farm Machinery • Parts and Components • Accessories • Production and Processing Equipment • Design • Production • Engineering • Management

VOL. 125 No. 7

Features • • •

A Preview of 1962 CARS

Also—15 New Product Items and other Features such as Machinery News, Metals, and Industry Statistics

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with the Texaco "Cleartex Cure" you can

DECREASE REJECTS AS MUCH AS 22%

Diluted cutting oil in automatics can mean a high reject rate. Read why a "Cleartex Cure" ends this dilution problem forever... keeps tool sharp... assures dimensionally accurate work—and reduces rejects as much as 22%.

In spite of precautions, lube oil leaks into the cutting oil sumps of up to 70% of all automatics. Diluted cutting oil not only piles up rejects, but also means shortened tool life, more downtime and substantial discarded cutting oil losses.

How a "Cleartex Cure" works. A "Cleartex Cure" stops this dilution problem. Your reject rate can drop by 22%. Here's why: Cleartex Oil—heart of a "Cleartex Cure"—is used in *both* cutting and lubricating oil sumps. It works as a hydraulic oil, too. Cutting oil strength is always full—regardless of leakage. Because of minimized losses and increased production, *you actually slash per-piece production costs as much as 40%.*

How to take a "Cleartex Cure." Getting the full benefits of a "Cleartex Cure" is easy. An experienced Texaco engineer will survey your automatic set-up. He'll tell you which machines will benefit from Cleartex. Our illustrated booklet, "Cleartex in Automatic Screw Machines," spells out the benefits of a "Cleartex Cure" in detail.

To get your copy, contact the nearest of more than 2,300 plants distributing Texaco Products, or write:

Texaco Inc., 135 East 42nd Street, New York 17, N. Y. Dept. AI-120.

TUNE IN: HUNTLEY-BRINKLEY REPORT, MON. THROUGH FRI.-NBC-TV

TEXACO

Throughout the United States

Canada • Latin America • West Africa

CALENDAR

OF COMING SHOWS AND MEETINGS

National Association of Corrosion Engineers, Western Regional Conference, Portland, Ore. .....Oct. 4-6

American Machine Tool Distributors' Association, Annual Meeting, Pittsburgh .....Oct. 4-6

American Foundrymen's Society, 9th Ohio Regional Foundry Conference, Cincinnati .....Oct. 5-6

Society of Automotive Engineers, National Aeronautic Meeting, Los Angeles .....Oct. 9-13

American Standards Association, 12th National Conference on Standards, Houston .....Oct. 10-12

National Screw Machine Products Association, Membership Meeting, White Sulphur Springs, W. Va. .....Oct. 12-15

American Institute of Electrical Engineers, 1961 Machine Tools Industry Conference, Rockford, Ill. Oct. 16-18

Magnesium Association Annual Convention, New York .....Oct. 16-18

American Society of Lubrication Engineers, 8th Joint Lubrication Conference, Chicago .....Oct. 17-19

American Society of Body Engineers, 16th Annual Technical Convention, Detroit .....Oct. 18-20

American Foundrymen's Society, Michigan Regional Foundry Conference, Michigan State U., Michigan .....Oct. 19-20

1961 National Conference on Industrial Hydraulics, "Versatility and Reliability of Fluid Power," Chicago .....Oct. 19-20

American Society for Metals, 43rd National Congress and Exposition, Detroit .....Oct. 23-27

Society for Nondestructive Testing, 21st National Convention, Detroit Oct. 23-27

American Society of Tooling and Manufacturing Engineers, Semi-Annual Engineering Conference, Toronto, Ont. .....Oct. 26-27

Metal Treating Institute, Annual Fall Meeting, Detroit .....Oct. 26-28

The Material Handling Institute, Joint Industry Annual Meeting, White Sulphur Springs, W. Va. Oct. 29-31

American Gear Manufacturers Association, Semi-Annual Meeting, Chicago .....Oct. 30-Nov. 1

National Metal Trades Association, 62nd Annual Convention, New York .....Oct. 31-Nov. 1

Industrial Management Society, Industrial Engineering and Management Clinic .....Nov. 1-3

KNOW YOUR ALLOY STEELS . . .

This is one of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.

How Alloy Steels Respond to Induction Hardening

In the induction-hardening process, steel is first heated above the transformation range by means of electrical induction, then quenched as required. Special equipment is needed, and heat is developed as follows:

High-frequency alternating current passes through a coil or inductor, with the result that a magnetic field is created in the coil. When the piece to be treated is placed in this field, it is heated rapidly by induced energy. With the various types of induction-heating equipment, the process is capable of surface- or case-hardening to various controlled depths; however, through-hardening can be obtained with certain alloy steels. Ferrous metals that respond well to induction hardening include numerous grades of both alloy and carbon steels, as well as hardenable stainless steel and plain or alloyed cast iron.

As a rule, when alloy steels which contain non-carbide-forming elements, such as nickel, are heated by induction, the usual hardening temperatures can be used. But with alloy steels that do contain carbide-forming elements such as chromium, molybdenum, and vanadium, the hardening temperature must be increased if the normal effect of the alloying elements is desired.

Hardness obtained by the induction process is a function of the carbon content and prior structure, just as it is when conventional heating methods are used. Nevertheless, higher surface-hardness values for a given carbon content have often been noted in parts subjected to surface induction-hardening. The extra hardness may be as much as five Rockwell C points for steels of 0.30 pct carbon.

As pointed out previously, the induction method requires special equipment. However, it possesses several marked advantages, including speed of heating and cleanliness of operation. Pieces heated by induction are usually subject to a minimum of scaling and distortion. Moreover, induction-hardening equipment is very compact and therefore conserves floor space.

If you would care to know more about the induction hardening of alloy steels, please communicate with our technical staff. Bethlehem metallurgists have made a thorough study of the subject, including the many details of quenching and tempering. Call them if they can help you in any way. And remember, too, that Bethlehem makes the full range of AISI standard grades, as well as special-analysis steels and all carbon grades.

This series of alloy steel advertisements is now available as a compact booklet, "Quick Facts about Alloy Steels." If you would like a free copy, please address your request to Publications Department, Bethlehem Steel Company, Bethlehem, Pa.

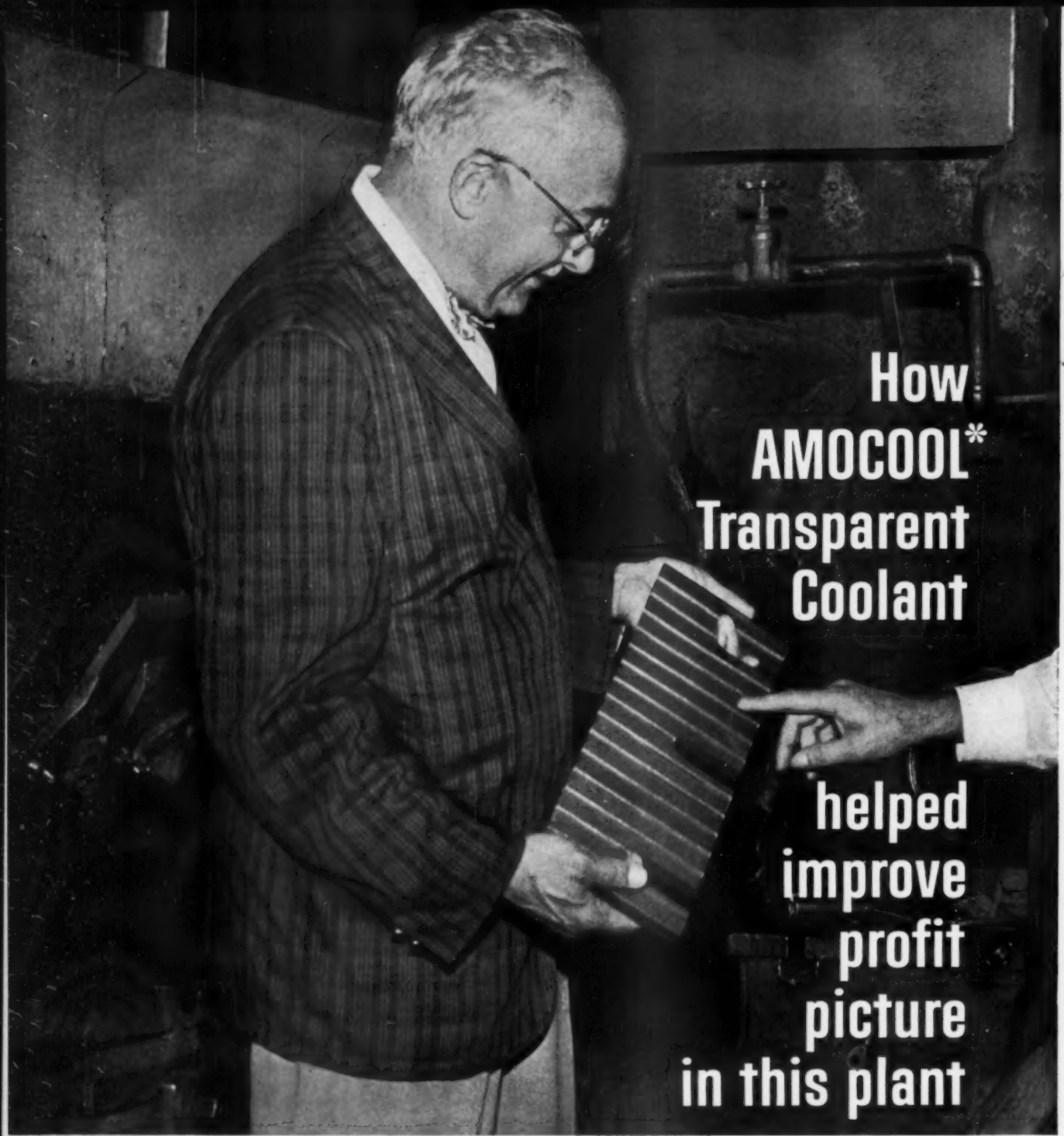
Steel

for Strength . . . Economy . . . Versatility

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. *Export Sales:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



How AMOCOOL* Transparent Coolant helped improve profit picture in this plant

*Trademark

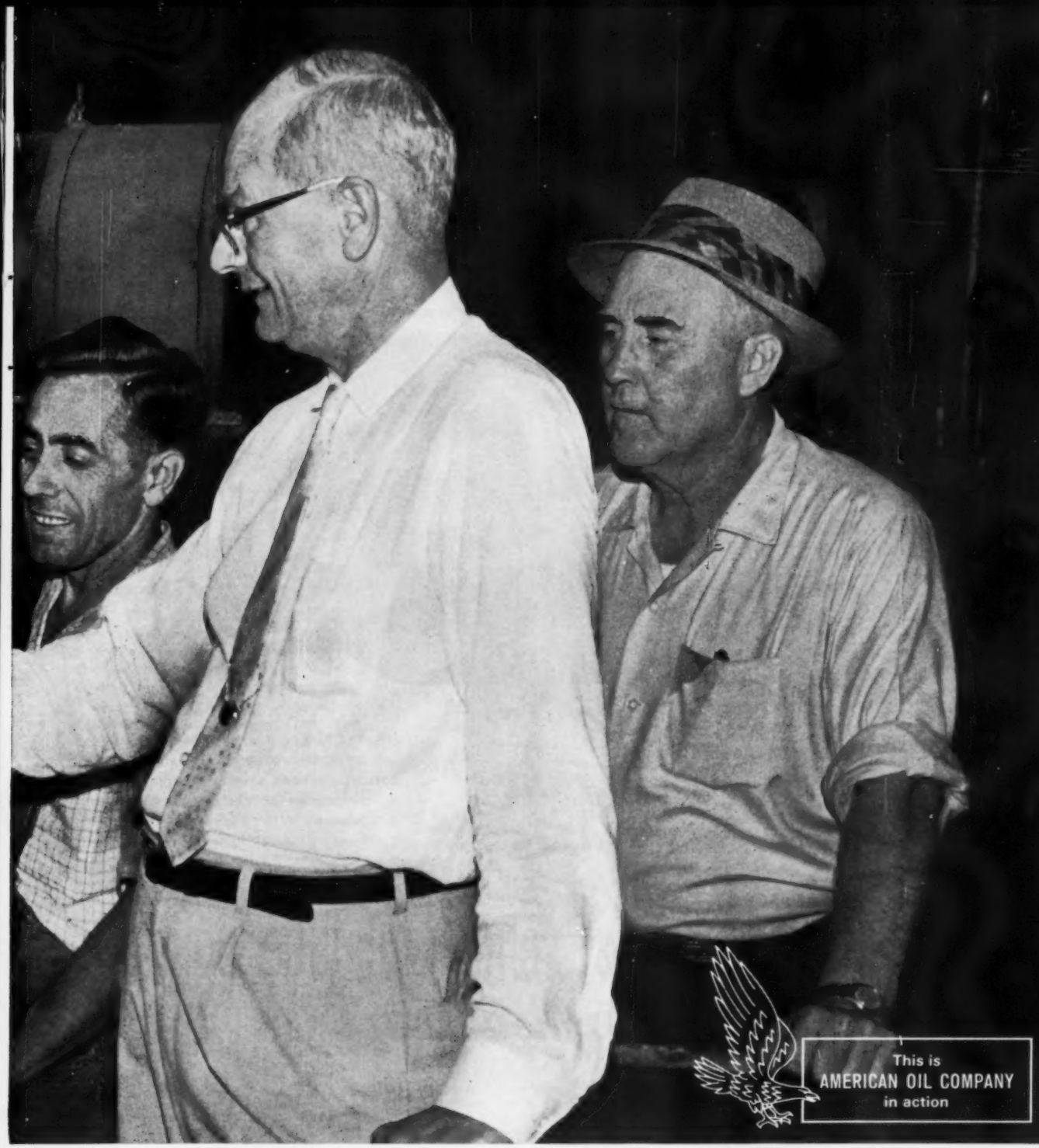
BY PAUL E. "PAPPY" STRATTON

About the Author. "Pappy" Stratton has been providing technical help on lubrication and metalworking problems to customers in the Detroit area for nearly all of the twenty-five years he has been working for the company. In addition to having this store of practical experience to help him, Pappy has completed the Company's Sales Engineering School.

* * *

By using a soap-base grinding compound, Detroit Edge Tool Company was getting excessive corrosion and rust on work and grinding machines. Oil vapor was collecting on machines and on the ceiling, causing dirty working conditions. Most important, high wheel loading was causing frequent down-time for wheel dressings.

We worked out a test program on AMOCOOL Transparent Coolant with the management. On our first test on one surface grinder, feed pressure was cut substantially while at the same time metal removal was increased.



Eliminate reworking because of rust, reduce wheel loading and extend intervals between wheel dressings; do these and you increase profit per unit, explains Detroit Edge Tool president, Dan Ebbing, to P. E. "Pappy" Stratton of American Oil. Plant manager, John Yonker (right) and Sam Vineh, operator, look on.

The cost of reworking parts to remove rust was eliminated. Time required to clean machines to get rid of the odor was cut in half. Less wheel loading and fewer wheel dressings have upped production and reduced costs. Our test program paid out in an improved profit picture. All grinding and drilling equipment has been converted to AMOCOOL Transparent Coolant.

* * *

Would you like this kind of technical help to assist you in improving profits? Get it by calling the American Oil Company office nearest you.

Quick facts about
AMOCOOL* Transparent Coolant

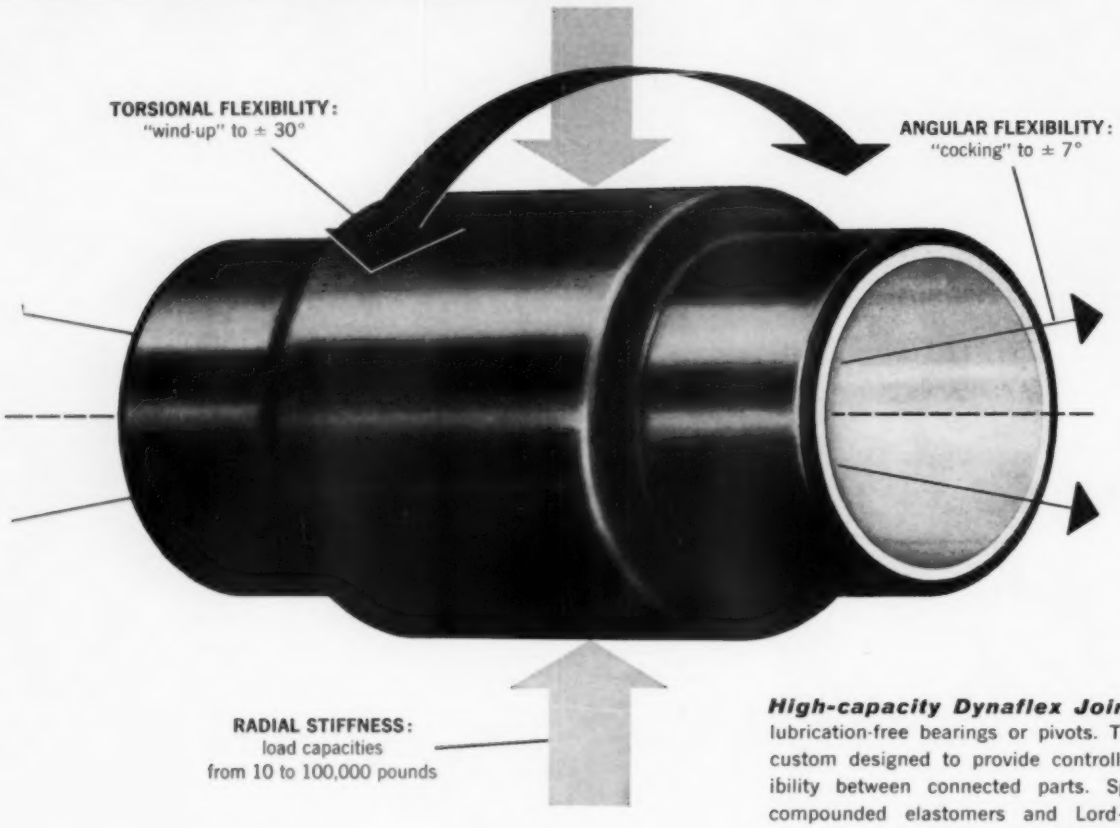
- Clear, transparent fluid
- Controls corrosion on work and machines
- All chemical. Does not support bacteria growth
- Unaffected by humidity
- Fire resistant
- Odorless

AMERICAN

AMERICAN OIL COMPANY
910 South Michigan Avenue
Chicago 80, Illinois

DESIGN FOR SUPERIOR PERFORMANCE

with Lord vibration/shock/noise control



High-capacity Dynaflex Joints are lubrication-free bearings or pivots. They are custom designed to provide controlled flexibility between connected parts. Specially-compounded elastomers and Lord-bonded construction assure longer life than metal units.

reduce installed cost, eliminate lube points

with Lord Dynaflex® Joints

Pivot points utilizing Dynaflex Joints offer real improvements in economy and performance.

These elastomeric pivots simplify assembly. Pressed directly into the as-cast recess or rough-machined socket, they insure positive radial positioning of parts. Exacting tolerances are not required; costly machining is eliminated. Grease fittings and periodic lubrication are outmoded; overall maintenance is greatly reduced.

Dynaflex Joints—used in torque and radius rod ends, load equalizer beams, spring eyes, machinery linkages, boom pivots—cushion shock, attenuate noise, reduce dynamic loading stress, assure accurate alignment.

Dynaflex Joints, with lower installed cost and longer service life than metal bushings, can be specially engineered for your application. Contact your nearest Lord Field Engineering Office listed here or the Home Office, Erie, Pa.

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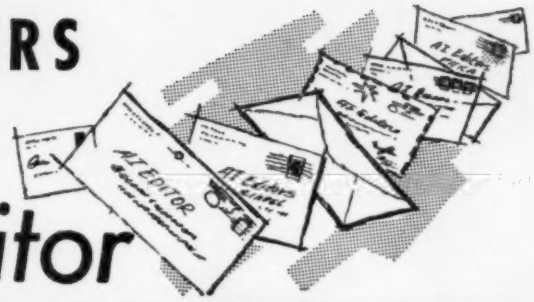
LORD MANUFACTURING COMPANY · ERIE, PA.

Circle 111 on Inquiry Card for more data

LETTERS to the Editor



Readers' opinions or requests for additional information on material appearing in the editorial pages of AUTOMOTIVE INDUSTRIES are invited for this column. No unsigned letters will be considered, but names will be withheld on request. Address *Letters to the Editor*, AUTOMOTIVE INDUSTRIES, 56th & Chestnut Sts., Philadelphia 39, Pa.

ROTARY CYLINDER ENGINE

Regarding item "Rotary Cylinder Engine Has Non-Reciprocating Pistons" in the August 1, 1961 issue of AUTOMOTIVE INDUSTRIES:

It is gratifying to see that your policy permits publishing of new designs irrespective of their possibly proved importance. It is useful for the general development of the industry to spread knowledge about work, which is going on in the various fields, even in those cases when such work has given negative results.

As regards the engine referred to above, it might have been made clear that it has not so far given satisfactory results and the possible reasons for this are:

(1) The pistons cannot turn even a slight amount around their bent longitudinal axis without a tendency to stick. To be able to run smoothly, they would have to be flexible in a sausage-like way.

(2) It is obvious that the angular velocity of the pistons in their circular orbit must be variable, if the housing rotates with approximately uniform angular velocity.

(3) The equal spacing of the 6 arms of the central spider will then not coincide with the slightly unequal spacing of the center of gravity of each of the 6 pistons, due to their reciprocating movements when the housing rotates. In other words, the ball joint in the center of each piston will have to slide a few hundredths of an inch back and forth along the crossbars.

(4) The gas pressure acting on the piston will be counteracted by a pressure from the ball joint, which has such a direction in the middle portion of the stroke, that the total side force of the piston is approximately as high as is the case in an ordinary engine having a connecting rod twice the length of the stroke.

(5) Due to the effect stated under (3) the pistons will be forced to move in and out radially in relation to the center of the engine a few thousandths of an inch. This, of course, requires a considerable piston clearance above that required for other reasons.

Summing up, I find that there are fundamental faults in the design which are bound to cause trouble. Obviously modifications of the details may eliminate those faults or compensate for misalignments, etc. Apart from that, there is no reason to expect that the friction of this engine to be smaller than that of an ordinary aircraft radial type. The designer's claim according to your correspondent that the engine should have a third the frictional losses of the usual gasoline unit is therefore surprising and cannot have been proved by experience.

Gunnar Ljungstrom
Chief Designer
Motor Car Division
Svenska Aeroplan Aktiebolaget
Trollhattan, Sweden

EPOXIES

It is with extreme interest that we have noted your article on Epoxy Resins in the July 15 issue of AUTOMOTIVE INDUSTRIES, pages 65 through 71.

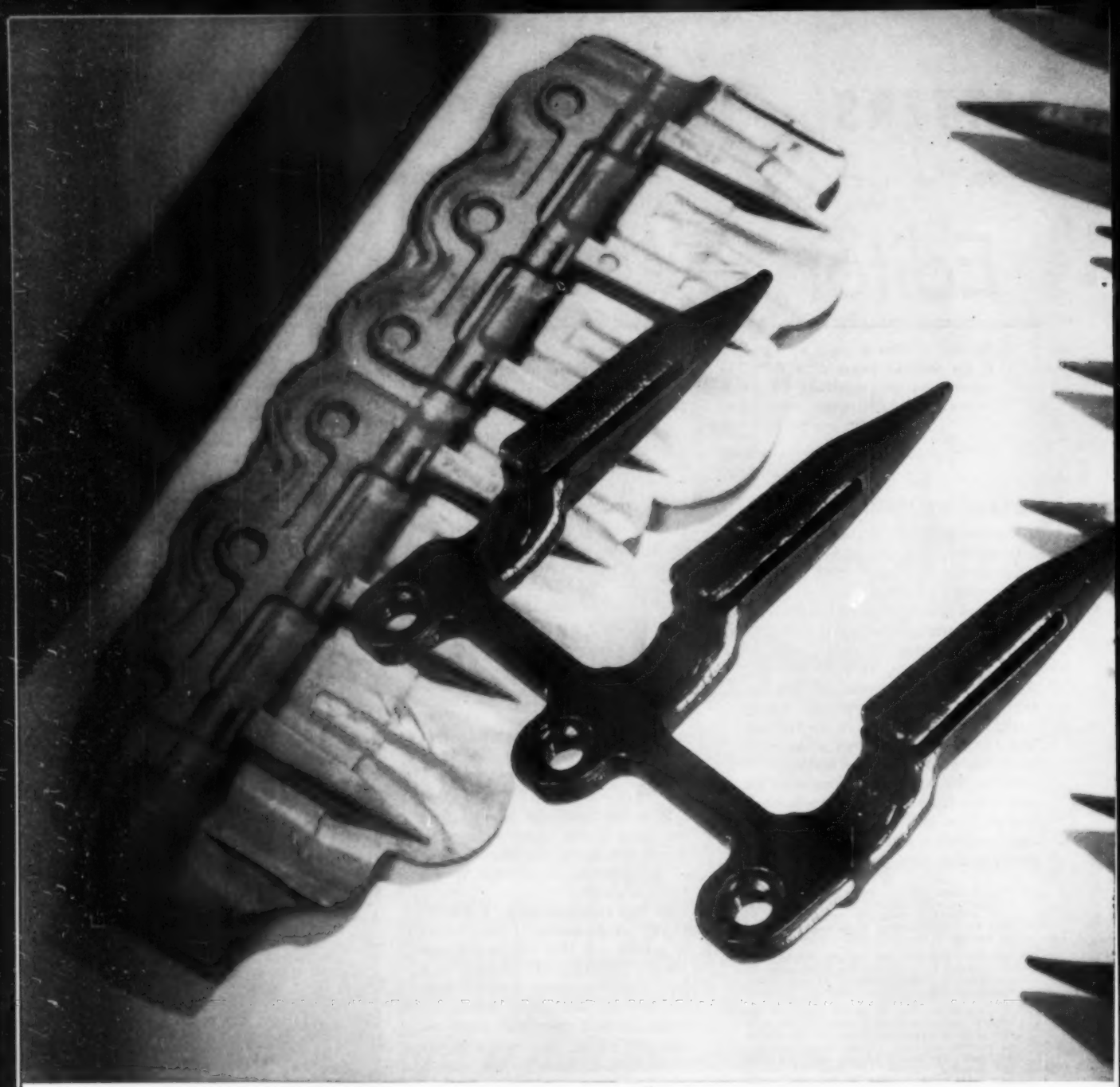
In this article you list "CARDOLITE" as an amine. I am pleased to inform you that this is not true since "CARDOLITE" NC-513 is a low viscosity epoxy resin flexibilizer having one epoxy group per molecule and, therefore, combines chemically in any cured epoxy resin formula.

R. E. Brown
Product Manager
Commercial Development
Minnesota Mining & Manufacturing Co.
Saint Paul, Minn.

DESIGN

I am interested in obtaining a copy of the article "Design Features of the Buick Special and the Olds F-85 Aluminum Engines," Part I. This article appeared in the April 15 issue of AUTOMOTOVE INDUSTRIES.

Harry W. Bielicki
Power Development
Engineering Staff
General Motors Technical Center
Warren, Mich.



ANGLES CHANNELS TEES HEXAGONS ROUNDS HALF ROUNDS

United States Steel offers the widest range of carbon and alloy bar sizes, shapes and grades available in the industry.
We're a single source for all your requirements.

Sickle guard forged from USS Bar Stock for longer life

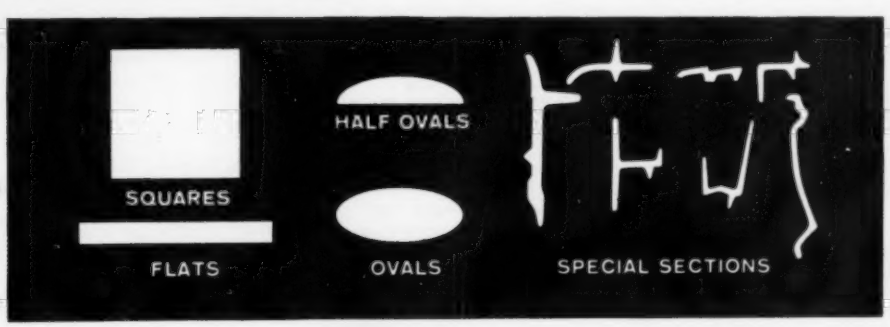
This forged and machined part will last longer than the cast design it replaced even though it weighs 12% less and costs less. It's a sickle guard used on the cutting platform of a line of John Deere self-propelled combines, and is manufactured by Buchanan Steel Products Corporation, Buchanan, Michigan.

John Deere wanted the part to be thinner for maximum cutting coverage at high speeds, and shock- and wear-resistant so that it could self-sharpen the blade. The designers specified forged steel because it would mean a lighter, tougher, more durable part. The part is forged from bar flat steel produced by United States Steel.

Design and fabrication possibilities are virtually unlimited with USS Carbon and Alloy Bar products. Forgings are usually fabricated from USS flats, rounds or round-cornered squares. And nowhere else can you get the range of sizes, shapes and grades offered by USS. You name it —we have it. Just call our nearest sales office, or write United States Steel, Room 6326, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

United States Steel Corporation • Columbia-Geneva Steel Division • Tennessee Coal and Iron Division • United States Steel Supply Division • United States Steel Export Company

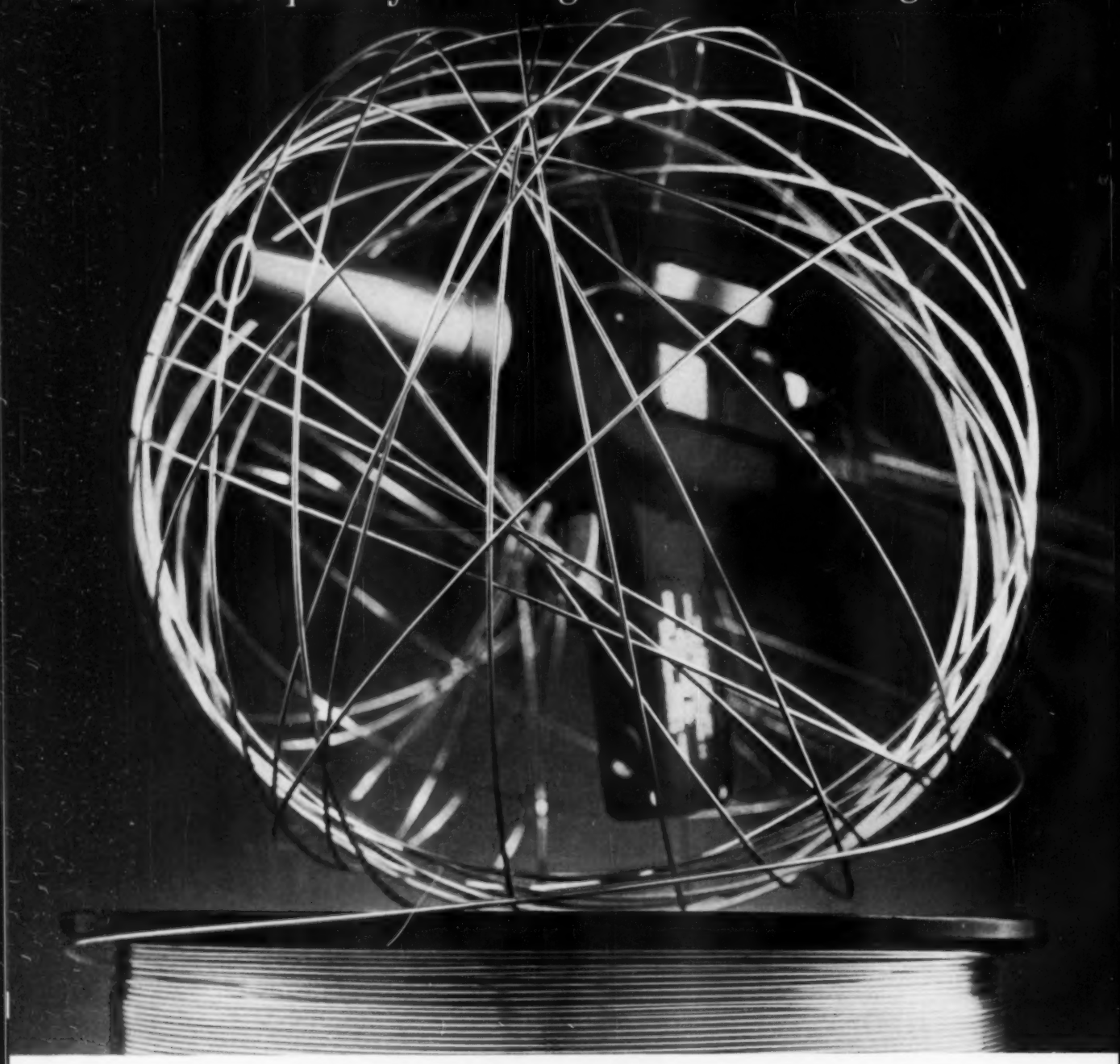
This mark tells you a product is made of modern, dependable Steel



USS United States Steel

TRADEMARK

for aircraft quality welding without cleaning costs—



Aircomatic welding wire

Aircomatic (gas-metal-arc) welding wire *is chemically clean* when packaged . . . *chemically clean* when you open it . . . *chemically clean* when you use it.

Specify Aircomatic and you don't have to spend up to 20¢ a lb. to clean your wire. Just open the package, load your feeder and you're ready for aircraft quality welding.

You get X-ray quality deposits too . . . because the chemical composition of Aircomatic wire is rigidly controlled.

You get constant arc conditions and low electrical resistivity . . . because of uniform surface conditions of the wire.

You get a steady, uninterrupted feed rate when you use Aircomatic wire . . . because helix is low and wire finish is mirror smooth.

Another plus value . . . the tensile strength of Aircomatic wire is uniform. And, finally, wear on guide train and contact tube is minor when they're handling Aircomatic wire.

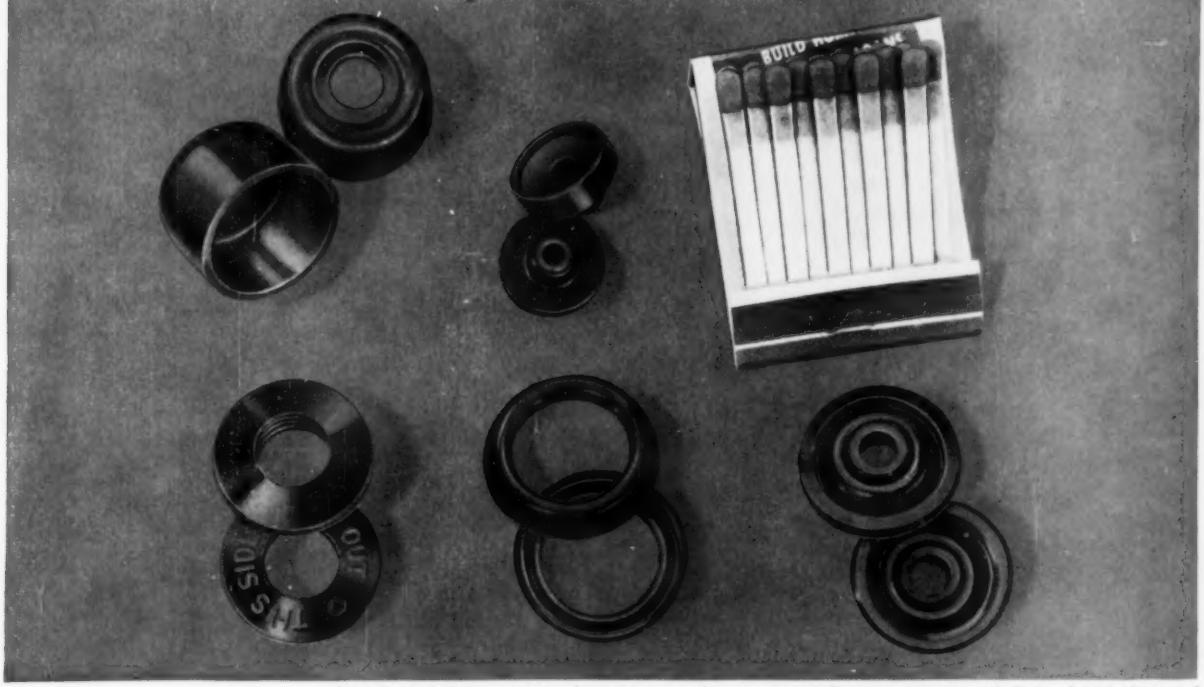
For current price schedule on Aircomatic quality finish aluminum, stainless, copper and steel welding wires . . . call Airco or look in your Classified Telephone Directory under "Welding Equipment and Supplies" for your nearest Authorized Airco Distributor.

AIRCO®

AIR REDUCTION

OHIO RUBBER

"CUSTOMEERED COMPONENTS BASIC TO INDUSTRY"



Wide range of parts includes (top, left to right): valve stem deflector, condenser seal, (bottom) seal piston rod packing, universal joint seal, and oil seal. These vary in dimensions up to 1½″ in diameter and 1″ in thickness.

NEW! Precision rubber parts continuously molded in high volume . . . at lower cost

Precise tolerances within ±0.003 in. are now possible in large volume production of custom-molded rubber component parts. Ohio Rubber's new high-speed, continuous molding process produces such parts at rates of up to 200,000 pieces per day.

Greater precision, which results in important savings on finishing costs, is assured through use of single-cavity, self-registering molds. They permit accurate, uniform application of pressure to minimize flash—maintain consistent tolerances for all dimensions. Uniform material thickness is equally assured by a plasticizing mill, which as an integrated part of the process directs uniform charges to each mold.

Direct feeding, from the mill to the mold wheel, eliminates the conventional intermediate extrusion step and further insures part uniformity and quality consistent with specifications. The continuous process permits *precise* control of time and temperature for each part.

Large volume production results in substantial cost savings for small, precision parts requiring tolerances obtainable by other precision molding processes. For parts formed by less precise, conventional methods, performance can be improved through greater accuracy—and without prohibitive increase in cost.

Quantity requirements involving 500,000 or more parts annually are recommended for most advantageous use of the new process. Since two similar parts of different size can be produced simultaneously by alternating the molds on the molding wheel, lower production runs which might not be economical can be combined with a separate order.

Complete information on this revolutionary new process is available in bulletin form. Send for your free copy today. At the same time, be sure to inquire about Ohio Rubber's complete component "Customeering" service—molding, extruding, and bonding-to-metal. Just mention ORCO Bulletin 715.

DE-260

ORCO **THE OHIO RUBBER COMPANY**

General Office • WILLOUGHBY, OHIO • WHitehall 2-0500

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EAGLE EP PICHER

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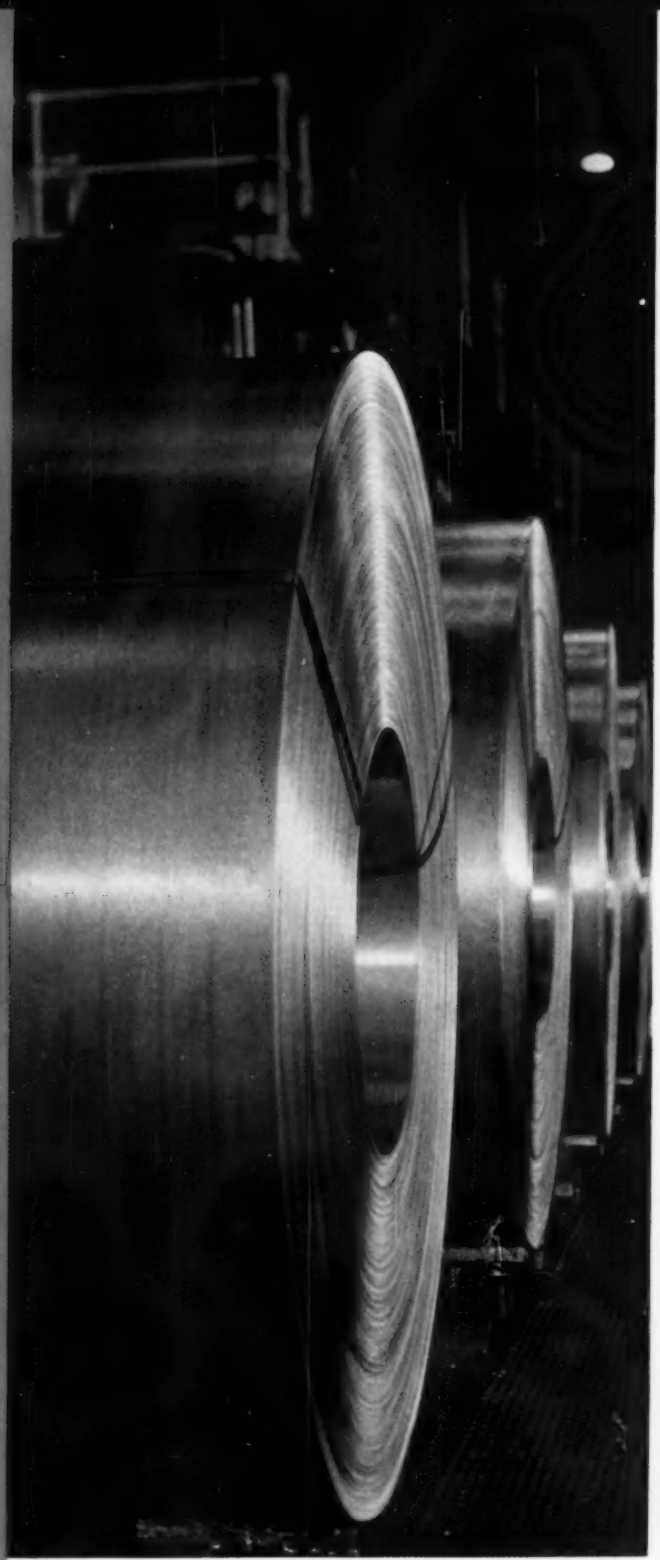

NEW 79"

You get larger coils, higher quality from Youngstown's big, new 79" hot strip mill

Higher quality hot rolled steel sheet in larger coils. That's what you get from our expanded and modernized 79" hot strip mill in Campbell, Ohio. To bring you improved hot rolled sheet and strip, more than $60,000,000 was invested. Probing television monitors and delicate, sensitive electronic devices plus massive roll stands, and bigger coilers combine to bring you even better quality control.

These improvements in our hot strip mill are only part of Youngstown's sheet and strip story. New coil annealing facilities, a new shear line and a new Youngstown open coil annealing process for one coat enameling sheets give you a growing source of hot and cold rolled steel products.

Get steel stamped with the mark of Youngstown. Get longer, stronger, flatter steel. Steel sheet and strip of more uniform quality. With better physical properties. Hot and cold rolled steel that is easier to work with and more economical to use because you can get larger coil sizes to 38,000 pounds. In 24" to 72" widths. Order to your specifications. Get fast, reliable delivery from your Steel Service Center or through the 28 Youngstown Offices.

Youngstown – growing force in steel

For full details on Youngstown steel sheet and strip, write: Dept. 11-A,
The Youngstown Sheet and Tube Company, Youngstown, Ohio

ON A GISHOLT SUPERFINISHER

MASTERLINE 81 Superfinisher

A single spindle vertical Superfinisher.

For flat, conical or spherical surfaces.

Superfinishing cycle is automatic—operator just loads and unloads.

Adapts to automatic handling . . . especially in-out conveyor systems.

Vertical design saves valuable floor space . . . simplifies addition to existing production lines.

The Model 81 is one of Gisholt's Superfinishers —ask Gisholt about the others.

Flat, cylindrical, tapered and spherical surfaces can be *Superfinished* to specifications faster . . . at less cost. You can produce any controlled finish from 1 to 80 micro-inches rms *automatically*. In many cases you Superfinish directly after turning, boring or facing, without intermediate grinding. On other parts, you rough-grind and then Superfinish. Either way, you save initial investment, grinding wheel costs, production time, work-handling and floor space . . . and, you eliminate *skilled* labor! Write for Catalog 1169-C.

GISHOLT
MACHINE COMPANY
Madison 10, Wisconsin, U.S.A.

Turret Lathes • Automatic Lathes • Balancers • Superfinishers • Threading Lathes • Factory-Rebuilt Machines with New-Machine Guarantee

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NEWS

Vol. 125, No. 7

October 1, 1961

Chevy II Makes Debut

New Line Offers 4 and 6-Cylinder Engines

Most exciting news at Chevrolet is introduction of the Chevy II, a distinctive new line mounted on a 110-in. wheelbase, in size and price between Corvair and Chevrolet.

Chevy II is launched with a choice of two engines—a four-cylinder engine rated 90-bhp at 4000 rpm, and a six-cylinder powerplant rated 120 bhp at 4400 rpm. A three-speed manual shift transmission is standard equipment and Powerglide with a slotted case is available as an option.

Chevy II employs fully unitized construction to which the assembly of front end sheet metal is bolted.

Single Leaf Rear Spring

The front suspension has high-mounted coil springs. Hotchkiss drive is employed for the rear suspension, the unique feature here being the first use in the industry of a special single leaf rear design. Rear axle design follows the pattern of axles for the regular Chevrolet line.

Both engines follow a similar design pattern and are characteristic of Chevrolet engine design philosophy. The main feature of both engines is compactness combined with great rigidity and ruggedness. This stems in part from the use of five main bearings for the four and seven main bearings for the six. Combustion chamber geometry is of the so-called "modified wedge" shape. The six is supplied with automatic choke. The four has a manual choke.

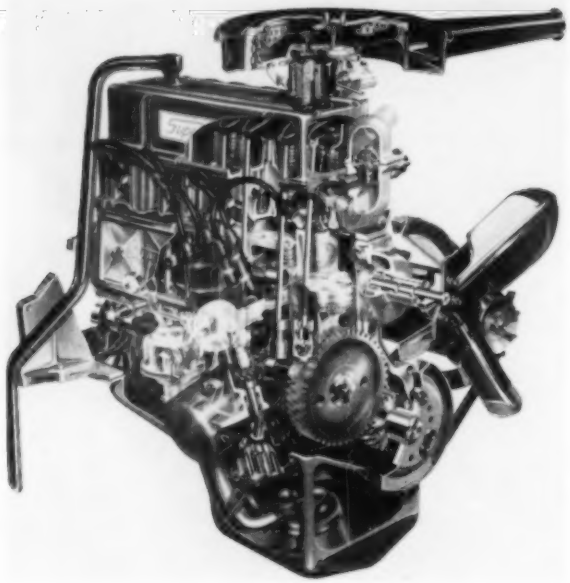
Pistons are of cast aluminum with flat, notched head and slipper skirt for the four. Pistons in the six have flat heads and slipper skirts. Compression rings are of cast alloy iron, and the top ring has a coating of flash chromium on the O. D. The lower ring has a wear-resistant coating.

Strut Assures Stability

Front suspension is a familiar independent design with high-mounted coil springs. It combines long and short control arms, with coil spring and shock absorber mounted atop the upper control arm. Lateral and longitudinal stability is provided by a strut attached to the lower control arm.

Distinguishing feature of the rear suspension is the special single-leaf rear spring of uniformly stressed type. The suspension consists of the leaf spring on each side, diagonally-mounted shock absorbers, compression type rear shackles, and a unique axle mounting ar-

Chevy II 300 4-Door Sedan



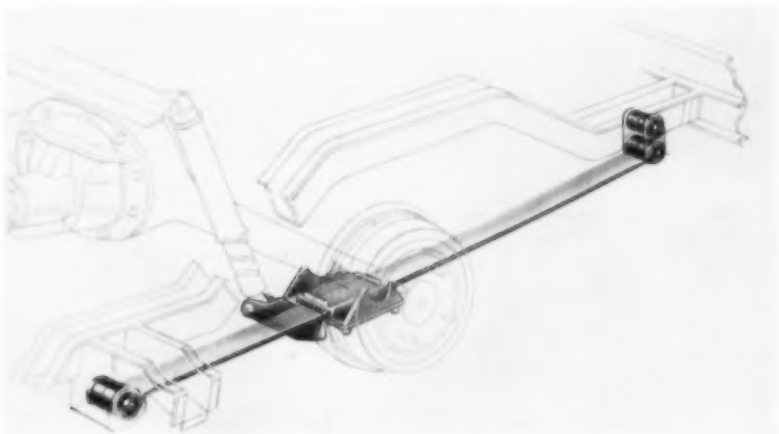
Cutaway drawing of Chevy II four-cylinder engine

rangement. This consists of sandwiching the center portion of the spring leaf between two heavy rubber pads. These pads, in combination with the Berlin-type spring eyes with large rubber bushings, isolate the spring from the axle and chassis, producing a smooth, quiet ride, free from vibration.

Chrome Carbon Steel

The leaf spring is made of chrome carbon steel from rectangular bar stock, rolled and worked in a special manner. Width and thickness vary almost continuously over the length of the leaf. In cross-section, the leaf is thick at the center, tapering to a thin section at the eye. In plan view, the leaf is narrow at the center and tapers to maximum width at the eyes. As a flexible beam the spring is uniformly stressed, thereby making the most efficient use per pound of material.

Another factor contributing to better utilization of material is that the maximum stress level in the single-leaf spring is more than 25 per cent higher than in multi-leaf springs. It is safe and practical to stress the single-leaf spring at higher rates because of the development of a unique shot peening technique which boosts fatigue properties and durability. In the new process only the top surface of the leaf is shot peened while the spring is stressed.



Chevy II's Unique Single-Leaf Spring

Chevy Spreads Work

Twenty-three Chevrolet manufacturing and assembly plants will produce the new Chevy II and components.

Included are plants in the following locations: Bay City, Mich.; Tonawanda, N. Y.; Cleveland; Detroit; Oakland, Calif.; Saginaw, Mich; Flint, Mich.; Farmington, Mass.; Livonia, Mich.; Kansas City; Toledo, O.; Willow Run, Mich.; Massena, N. Y.; Muncie, Ind., and Norwood, O.

Chevrolet explained the plants were chosen to take up any slack in standard Chevrolet or Corvair production caused by the Chevy II.

GM Plants Started

Construction has begun on the new Chevrolet and Fisher Body assembly plants at Fremont, Calif. Scheduled for completion in July, 1963, the plants will be located on a 392-acre site near Oakland.

The Chevrolet plant will build passenger cars and trucks. Car bodies will be assembled at the Fisher Body plant.

White's New Diesels

White Motor Co. has announced a new line of compact trucks powered by Diesel engines.

J. N. Bauman, president, said the new models offer practical use of Diesels in city and suburban hauling operations where gross weights up to 28,000 lb are required.

Ford Acquires Philco

Ford Motor Co. has announced plans to acquire Philco Corp., manufacturer of radio, television, home appliances and electronic equipment. The purchase price is estimated at $100 million.

The purchase agreement would make Philco a wholly-owned Ford subsidiary and would exchange one share of Ford common stock for each 4½ shares of Philco common. Holders of Philco preferred stock would receive for each share, Ford common with a market value of about $101.50, plus cash equal to accrued and unpaid dividends.

Philco has plants in Lansdale, Spring City, Willow Grove, Blue Bell and Watsontown, Pa., in addition to two Philadelphia plants. There also are Philco operations in Palo Alto and Menlo Park, Calif., Sandusky, O., and Fairfield, Iowa, and Connersville, Ind., as well as four overseas plants and about 35 subsidiaries.

MOBILE AIR DEFENSE MISSILE SYSTEM

Army Secretary Elvis J. Stahr, Jr. (left), and C. R. McBride, vice president of General Dynamics Corp., inspect first model of Mauler, an Army mobile air defense missile system under development. Mauler is designed to destroy enemy aircraft and short-range enemy ballistic missiles and rockets. It will contain its own power supply, target detection and fire-control equipment.

Love Named Chairman

George H. Love has been elected chairman of the board and chief policy officer of Chrysler Corp. Mr. Love previously served on Chrysler's board of directors as chairman of the Executive Committee.

In another move, Lynn A. Townsend, Chrysler president, was named chief administrative and operating officer.

As board chairman, Mr. Love will represent the board in policy matters and Mr. Townsend will be responsible for running the business.

The board also elected Irving J. Minett a vice president. Mr. Minett, group executive and chief operating officer of the corporation's International Operations, thereby becomes a member of the Administrative Committee.

GM Leads in Defense

Automotive and engine manufacturers, with $540.8 million, were awarded 1/32d of all defense contracts totaling $16,147.5 million in the calendar year 1960.

General Motors led the automotive list with $213.7 million of work and was 21st on the list of all U. S. concerns engaged in defense work.

Chrysler Corp. was 22d with $199.5 million in contracts.

Continental Motors Corp. was 50th with $62.4 million and Ford Motor Co. was 70th with $36.2 million. International Harvester Co. was 82d on the list with $29 million of contracts.

NEWS

CONTINUED

Dodge's 1962 Trucks

A functionally-styled line of conventional models, a compact forward-control unit, improved electrical components, and increased gross combination weights on Diesels highlight the 1962 Dodge trucks.

In addition to its lineup of conventional models, one of the highlights of the Dodge line is a compact half-ton forward-control chassis which offers exceptional maneuverability and short turning radius.

Featuring a 104-in. wheelbase and a maximum gross vehicle weight rating of 5100 lb, the new unit is available with either of Dodge's inclined six-cylinder gasoline engines—the 225-cu in. model developing 140-hp or the 170-cu in. version producing 101-hp.

3-Speed Transmission

A three-speed Synchro-Shift transmission is standard and three other models are available, including the three-speed LoadFlite automatic push-button unit.

The new Dodge line includes 11 gasoline engines ranging in horsepower from 101 to 228.

Seven Diesel engines are offered, ranging from 160 to 250 hp.

Alternator Is Standard

A wider use of Chrysler-built electrical components is reflected in the new models. Included are such items as the alternator, voltage regulator, distributor, solenoid shift starter and ballast resistor.

All gasoline models are equipped with a 35-ampere alternator as standard equipment.

A solenoid-shift starter, used for many years on high-tonnage units, is being offered for the first time as standard equipment on all gasoline models.

Gross vehicle weight ratings on the new trucks range to 53,000 lb and gross combination weight ratings to 76,800 lb. Maximum GCW ratings have ben increased 10,000 lb on Diesel models KCT-800 and NCT-800, and 5000 lb on the NCT-900 with the NHE-195 Diesel engine.

Maximum GCW rating now is 60,000 lb on the KCT-800, 65,000 lb on the NCT-800, and 70,000 lb on the NCT-900.

A new three-speed automatic transmission is available on conventional half, three-quarter, and one-ton units, and also on three-quarter and one-ton forward-control models. The transmission and torque converter housing is a one-piece aluminum die casting, resulting in a weight saving of 60 lb.

Heaters Now Standard

For the first time, Chevrolet is offering deluxe heaters as standard equipment on all its 1962 cars. The move is considered a major development in the automotive merchandising field by Chevrolet. In the past, it was the practice to offer heaters as an optional extra even though over 90 per cent of Chevrolets had the units installed at the factory.

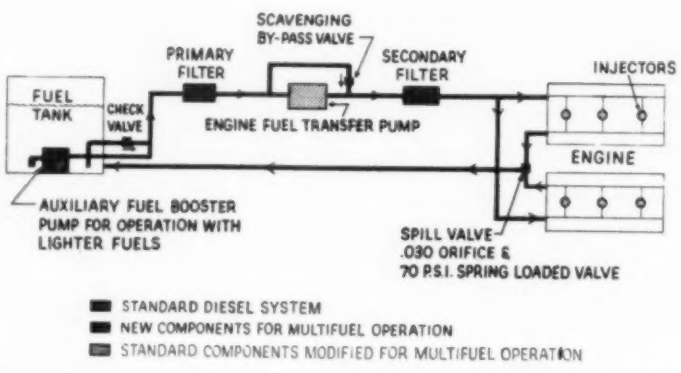
In addition to the heaters, the latest Chevrolets, Corvairs, Corvettes, and the Chevy II will offer cigarette lighters, front seat arm rests and right-hand sun visors as standard equipment.

Perkins Outboard

An all-out attack on the U. S. market will be launched by the Perkins Group with a new range of outboard engines. Perkins said they had a completely new 40 hp motor so silent that experts say it will set new standards for this type of engine.

CHART OF DETROIT DIESEL MULTIFUEL ENGINE

DETROIT DIESEL MULTIFUEL ENGINE FUEL SYSTEM



Additional details of multifuel engine developed by Detroit Diesel Div. of General Motors Corp. are shown in above chart. The engine was pictured in an accompanying story in the Sept. 1 issue of AUTOMOTIVE INDUSTRIES.

Another new

B.F.Goodrich Chemical *raw material*

NOW

make these and other products of newly available...

Absson

Absson—a versatile acrylonitrile-butadiene-styrene material—becomes the newest addition to the growing line of quality plastic materials from BFG Chemical.

Absson has superior flow characteristics for molding and extruding—gives high gloss, excellent surface finish, and fine detail to finished products. You can count on its uniform high quality.

Production and application knowledge as well as samples are available. Write Dept. NP-6, B.F.Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

Absson T.M.

ABS MATERIALS

B.F.Goodrich Chemical Company
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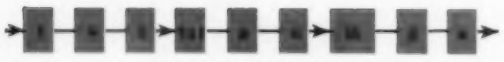
CINCINNATI

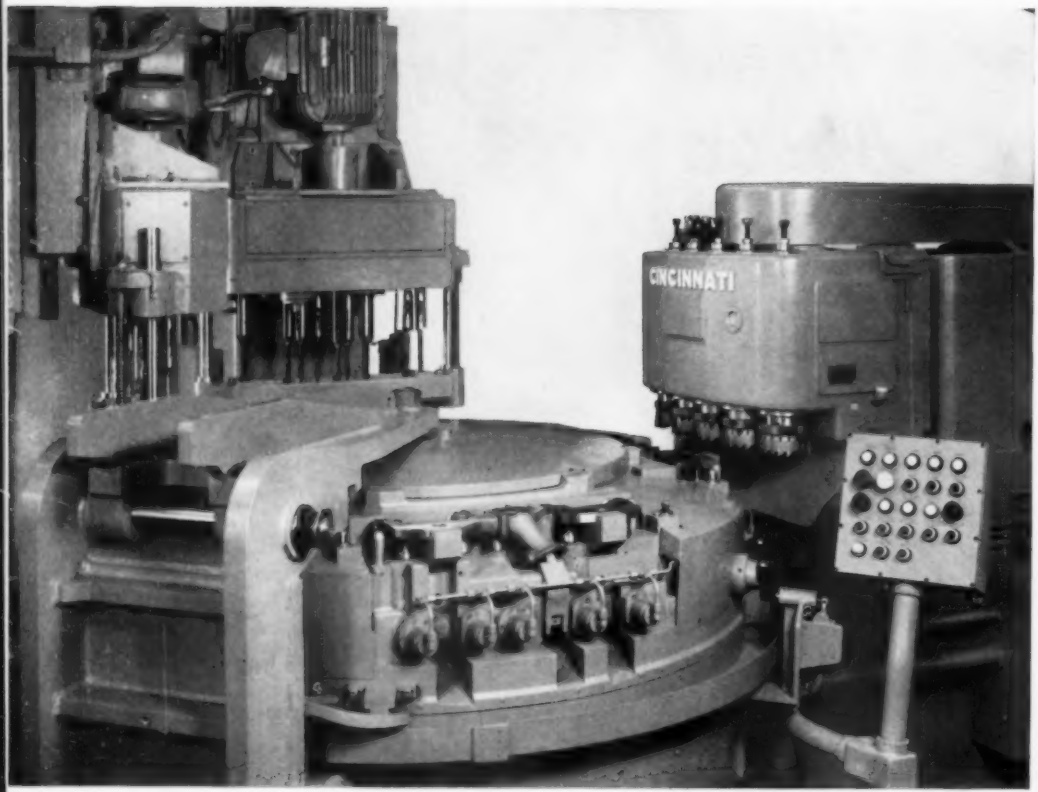
CINCINNATI | SPECIAL MACHINE DIVISION

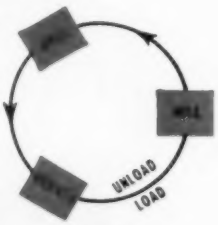
plans and develops low-cost production tours



Straight Line

Straight Line and U-Turn





Rotary Index

Milling, drilling and broaching of exhaust manifolds is completed on this CINCINNATI Rotary Index Machine at a production rate of 105 parts per 48 minute hour. Broaching is free, performed during the rapid index segment of the cycle.

PRODUCTION "TOURS" planned and developed by Cincinnati give you a fresh outlook on how low production costs can really be. The work may progress from one operation to the next in a straight line, U-turn or circle.

One giant 36-Station Transfer Line built by Cincinnati automatically machines V-6 and V-12 cylinder blocks. The blocks move through the world's largest broaching machine, then follow a straight line through drilling and milling stations, finally taking a space-saving U-turn through two more milling stations. In another Cincinnati production line, aluminum transmission cases follow a straight path while receiving 33 machining operations. Some types of parts are particularly adapted to a circular production tour. Cincinnati's Special Machine Division has built many machines of this type, some for milling, others for milling and drilling, while still others include a free broaching operation. One example is illustrated above.

Whatever your metalworking requirements, you can be sure that Cincinnati's 47 years' experience in building automatic machines and production lines will result in the lowest production cost and the highest degree of dependability. May we help you? **Special Machine Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.**

CINCINNATI®
SPECIAL MACHINE DIVISION

DESIGNERS AND BUILDERS OF
SPECIAL MACHINES • HORIZONTAL BROACHING MACHINES • COMPLETE PRODUCTION LINES

On the Mack assembly line, a worker attaches the turbocharger unit to a rugged thermodyne engine. Casing of Ni-Resist iron withstands temperatures from 1200° to 1400°F. Ordinary cast irons tend to crack, warp and scale under such heat.

How Mack builds a high-power diesel for low-cost runs...with Nickel-alloyed castings

"Built like a Mack"—for power, for low operating cost. Those are the words to describe the Mack Thermodyne® turbocharged diesel. And the 17-year combination of Mack engineering skill and nickel-alloyed castings makes it possible. Here's how the combination works in the famous Mack Thermodyne:

Ni-Resist* nickel-alloyed austenitic cast iron turbocharger casing with 20% nickel withstands the heat and thermal shock from hot exhaust gases, fights off scaling and oxidation for long, trouble-free turbocharger life.

Nickel cast irons provide the strength and durability for the massive engine block and cylinder heads. They more than meet the pressure-tightness needs of this high-compression engine.

Ni-Resist piston ring inserts with 13½ to 17½% nickel withstand the heat, gas pressure, and pounding of piston rings to drastically cut chance of "blow-by", loss of power and excessive oil consumption.

Rugged nickel-alloyed castings keep an engine in service, where the profits are . . . out of the shop, where costs are. So, if you build or use heavy-duty diesel engines, specify nickel-alloyed parts. You'll be specifying power *and* economy.

®Registered T. M. Mack Trucks, Inc.
*Registered trademark

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

INCO NICKEL

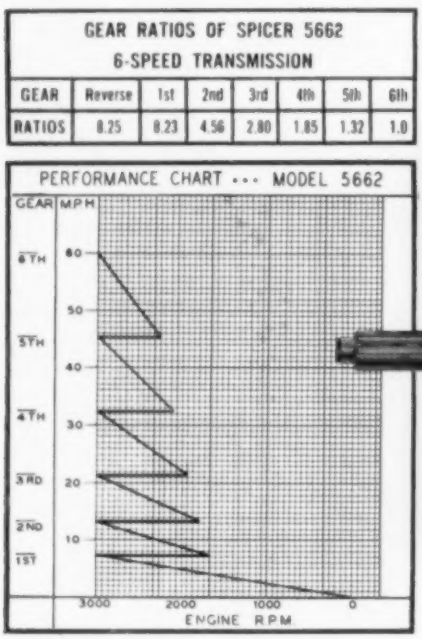
NICKEL MAKES CASTINGS PERFORM BETTER LONGER

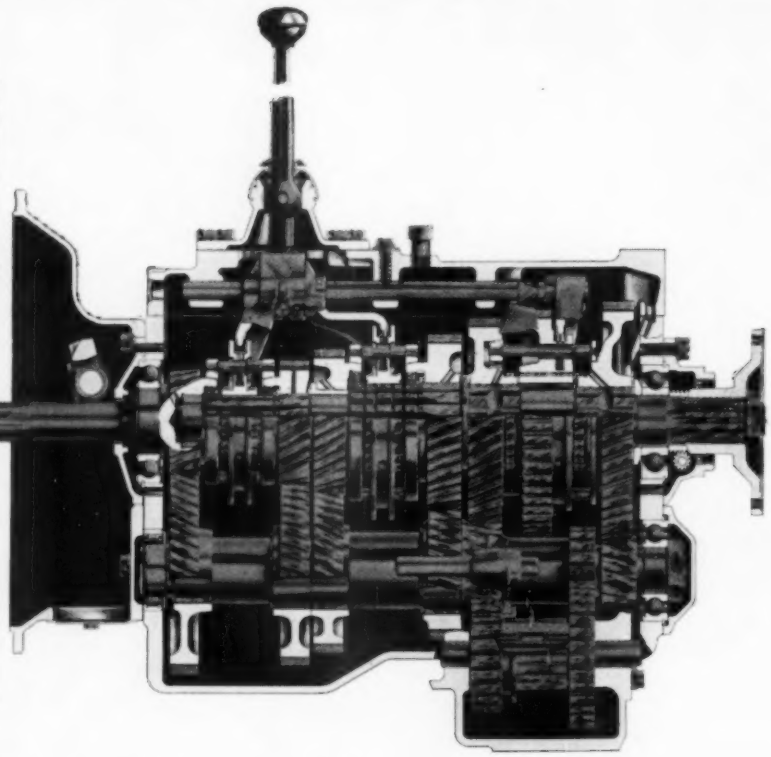
←——Circle 118 on Inquiry Card for more data

NEW SPICER 6-SPEED TRANSMISSION Offers Smoother, Faster Shifts For Over-The-Road Trucks!

GEAR RATIOS OF SPICER 5662
6-SPEED TRANSMISSION

GEAR	Reverse	1st	2nd	3rd	4th	5th	6th
RATIOS	8.25	8.23	4.56	2.80	1.85	1.32	1.0





Direct Drive in 6th for High-Speed Engines

The New Model 5662 Spicer 6-speed transmission has direct drive in sixth, an 8.23 to 1 low gear ratio, a conventional shift pattern, and closer shift steps in top gears for more efficient highway performance. The top five speeds are fully synchronized for faster, smoother, no-clash shifting. Nominally rated at 375-400 lbs. ft. torque, the new unit is an ideal transmission for vehicles in the 60,000 GCW range.

Operators of trucks with 5-speed transmissions, particularly those with supplemental gearing who don't use all available ratios, will find the new Spicer 6-speed can eliminate the additional weight associated with such gearing.

The model 5662 6-speed teams up well with Spicer's newest 12" two-plate, spring loaded clutch, and operates smoothly with Spicer's old reliables, the 14" and 15½" multiple lever, single-plate clutches. Cast iron case has standard SAE 6-bolt apertures for side-mounted PTO's. Case also adaptable for conventional overhead or remote control shifting.

For full information on the new Spicer Model 5662 transmission, write to Dana Corporation, Toledo 1, Ohio.

DANA Spicer **DANA CORPORATION**
Toledo 1, Ohio

SERVING TRANSPORTATION—Transmissions • Auxiliaries Universal Joints • Clutches • Propeller Shafts • Power Take-Offs Torque Converters • Axles • Powr-Lok Differentials • Gear Boxes • Forgings • Stampings • Frames • Railway Drives

Many of these products are manufactured in Canada by Hayes Steel Products Limited, Merritton, Ontario

Circle 120 on Inquiry Card for more data

NEWS

FEATURES

Imports Below 300,000?

U.S. Compacts Repel Foreign Invasion

If the import car trend continues to decline in the last five months, less than 300,000 cars of all sizes will be imported this year.

This is less than half the 668,070 cars imported in 1959, the record year, Bureau of Census figures reveal.

With more U. S. compacts available in 1962 models, an even further drop in imports is possible, although Detroit officials have pegged the import figure at 400,000 units for the next few years.

This figure could be slashed drastically by introduction of Chevy II and the proposed Cardinal, Ford's compact compact.

Continue to Decline

When the first American compacts emerged, imports dropped to 444,474 units by the end of 1960, still quite a total loss to American manufacturers.

For the first seven months this year, there were 154,985 imports, less than half the total for the first six months last year.

Bureau of Census figures reveal 334,180 imports in the first half of 1959 and 333,890 in the second half. The first six months of 1960 saw 311,117 imports. The decline really began in the second half, when there were only 133,357 imports.

The first significant drop in imports occurred in the second half of 1960 and reflected a market of less than 43 per cent as compared with the first half. More significantly, however, the decline persisted into the first seven months this year.

If 1961 imports fall below 300,000, this will mean only about 45 per cent of the cars imported in 1959, the record year.

American manufacturers believe the variety of smaller cars in 1962 will lure even more buyers from foreign cars. They hope the imports will drop below 200,000 and no longer pose a major problem to domestic producers.

SOMETHING NEW IN AIRCRAFT LOADERS

Squat cab only four ft two in. high enables Douglas Cargomaster to be driven beneath big jetliners to speed baggage handling. Body of the British truck elevates to 12 ft. A moving floor transfers load onto hinged drawbridge conveyor that can be positioned to extend into any cargo hold.

AI TABLOID

A condenser for the vacuum distillation of metals that can be used with liquid metal fueled reactors to separate fission products from the fuel and carrier metal mixture is described in an Atomic Energy Commission research report.

* * *

Cash dividend payments by corporations issuing public reports amounted to $935 million in July, compared with $895 million in the same month last year. The communications and public utilities each increased 12 per cent.

* * *

Load-bearing characteristics of intermetallics, graphite and some ceramics, while steadily being improved, nevertheless still fall far short of industry's search for materials operable over a bearing range of from −450 to 3000 F, according to a recent survey.

* * *

Consumption of new rubber in the U. S. for July amounted to 110,215 long tons, a 14 per cent decrease below the June figure. The drop was mainly caused by vacation shutdowns, according to the Rubber Manufacturers Association, Inc.

* * *

Greater safety in the design of automotive lifts is provided for in a revised industry standard under development. The new standard will be published when sufficient additional endorsements are received from manufacturers.

* * *

During the second quarter of 1961, production of motorized fire apparatus in the U. S. totaled 623 units. Pumper units numbered 536; there were 36 aerial ladders, and 51 miscellaneous units.

* * *

Leather garments and gloves that resist deterioration from perspiration and hot, soapy water—yet have a good finish and soft "feel"—are now possible through a new tanning process. Based on glutaraldehyde, the process was developed by the U. S. Dept. of Agriculture at Wyndmoor, Pa.

A Soviet study of rare earth spectroscopy — described by Russian scientists as the first systematized analysis of the experimental and theoretical data in this field—has been translated and released to American scientists.

* * *

The techniques of electropolishing and chemical polishing as nonchemical means of surface finishing metal are described in a memorandum released to industry and the public. Also available is a memorandum on recent developments in the evaluation of special metal properties.

* * *

Major research efforts in the technology of high-strength stainless steel are being directed toward the development of alloys with improved strength properties.

* * *

Soviet industrial research laboratories are finding it no easy matter to compete with Russian universities for the services of scientists and technologists. So far the universities are leading in the race since they can pay a scientist three or four times as much as he could make doing research.

* * *

The interstitial and sulfur contents of cobalt can be reduced by electron beam melting. Also, ductile cobalt sheet can be obtained from electron beam melted cobalt ingots, according to an Air Force study of the effect of electron beam melting on various compounds and metals.

* * *

Pure aluminum alloys, impact-extruded and protectively coated, seem to be the most feasible materials for food containers used in space flight.

* * *

Methods of applying zinc coatings to protect columbium from oxidation at high temperatures are described in a memorandum released by the Office of Technical Services, Business and Defense Services Administration, U. S. Dept. of Commerce.

New Type Craft

The Navy has awarded an $8,750 contract to Anti-Friction Hull Corp., Laurel, Md., for the design and construction of a landing craft which will use an air pocket under the hull to reduce friction.

The craft will be similar to an LCVP (Landing Craft - Vehicle, Personnel) in topside appearance. The underwater body will be different, since it is designed to retain an air pocket induced under the hull by blowers. The air pocket will be retained under the hull by two keels located on the outboard sides of the craft and movable flaps in the bow.

Plans call for the new craft to be 36 ft. long and 11 ft. wide. It will have a carrying capacity of several thousand lbs and, unlike usual landing craft, is expected to be capable of high speeds.

Doubled Tire Life?

Production of a revolutionary new synthetic rubber that will provide 35 per cent more tread wear and eventually may nearly double tire life was announced by the Goodyear Tire & Rubber Co.

The man-made rubber, known as Budene, stems from a $5 million research and development program. Made from a petroleum derivative called butadiene, it will go into commercial production at Goodyear's new Beaumont, Tex, plant.

In addition to its tire applications, the new material will find wide use in conveyor belts and industrial rubber goods, according to H. R. Thies, general manager of Goodyear's Chemical Div.

S-P Diesel Trucks

Medium duty trucks and tractors with assembly installed Diesel engines are being manufactured for the first time in the United States by the Studebaker-Packard Corp.

Studebaker Diesels are rated at 19,500 and 23,000 lb gross vehicle weight, and 35,000 and 41,000 lb gross combination weight. Four wheelbases are available, ranging from 131 to 195 in.

Series 53 Diesels

The power plants are Series 53 four-cylinder, two-cycle engines manufactured by General Motors Detroit Diesel Div.

The engine produces 130 hp at 2800 rpm, an engine speed normally reached in truck operations. It delivers 271 ft-lb of torque at 1500 rpm. The 212.3 cu in. power plant is remarkably compact for a Diesel with its horsepower. Compression ratio is 17 to 1, and the engine has a 3⅞ in. x 4½ in. bore and stroke.

Heavy Duty Construction

Studebaker Diesels have heavy duty construction to insure full Diesel truck capacity. The 19,500 GVW model has a 5000 lb and 15,000 lb rating on its front and rear axles respectively. The 23,000 GVW model is rated 7000 lb on the front axle, and 16,000 lb on the rear axle.

A wide range of optional equipment is available, including power steering, Climatizer (fresh air heater with defroster), Hill Holder, windshield washer, tinted glass and radio.

The transmissions are direct four-speed, with an optional choice of direct five-speed or overdrive synchromesh. Electrical systems are equipped with a 30 amp generator and a 140 amp battery.

Vacuum brakes are standard equipment, with air brakes offered optionally.

All models are offered with a chassis and cab, or chassis with cowl.

Castings Decrease

One hundred and seventy-four gray iron foundries reported operations at 55 per cent of ideal capacity in July. This compares with 67 per cent reported in June. The reporting foundries shipped a total of 59,964 tons in June, including 973 tons of ductile iron and 700 tons of high alloy iron castings.

New GM Transmission

The Allison Div. of General Motors Corp. soon will begin production of a new heavy-duty Torqmatic transmission for high-production motorized equipment in the 200-300 hp range, it was announced by R. E. Lynch, manager of Transmissions Operations.

Designated CLBT-4460, the transmission is designed to handle 700 net ft lb of engine torque at engine speeds up to 2500 rpm.

Hydraulic retarder, lock-up clutch, converter and four power take-off openings are standard features of this compact 925-lb full-power-shifting transmission which is designed with six speeds forward and one reverse.

MOBILE LOUNGE FOR CAPITAL'S DULLES AIRPORT

Chrysler Corp. and Federal Aviation Agency engineers are testing prototype mobile lounge designed to transport airline passengers between terminal buildings and aircraft. The unique model, said to be the largest passenger-carrying vehicle ever built to be operated on rubber tires, can transport up to 90 persons. It is 54 ft long, 16 ft wide and 17½ ft high. It can be driven from either end. Power is supplied by twin 172 hp engines at each end of the lounge. Suspension on the 76,000 lb vehicle is by coil springs and shock absorbers. The Budd Co. was the main subcontractor for body construction.

CHRYSLER 1962 LINES

Imperial and Chrysler Models

CHRYSLER

Imperial

The Imperial LeBaron four-door hardtop features a new rear end styling treatment highlighted by gun sight tail lights. Its limousine-styled rear window, framed by a town car roof canopy, gives privacy to rear seat passengers.

CHRYSLER

300

This new line for 1962 with sports car styling features top grain all-leather bucket seats and three high-performance engines ranging up to 380 hp. The two-door hardtop shown is companion of sporty convertible and four-door hardtop.

CHRYSLER

New Yorker

With its 126-in. wheelbase, the exclusive New Yorker series offers full-size car luxury. Powered by a 340-hp engine, the top car in the Chrysler line is available as a four-door hardtop as shown, four-door sedan and station wagon.

CHRYSLER

Newport

Most popular series last year, the Newport continues to offer full size car advantages in lower price range. It has new rear-end styling and new grille. Its 305-hp engine combines performance and economy. Shown here is the two-door hardtop model.

Hardtop

• *Plymouth Fury*

CHRYSLER'S middle-size Plymouth line offers 23 models and four engines in the Savoy, Belvedere and Fury series. Four engine offerings range from the standard 30-D Economy Six to the optional high-performance Golden Commando V-8.

The Fury convertible with Golden Commando V-8 engine has a new shape and proportion in its advanced styling approach.

Convertible

Polara

• *Dodge Polara*

• *Dodge Dart*

Dart

Lancer

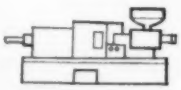
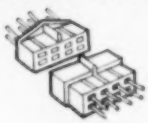
Valiant Signet 200

• *Dodge Lancer*

• *Valiant Signet 200*

This year Lancer offers a 770 and and 170 series and a sports model hardtop as the only body style in a new premium line called the "GT." New to the Valiant lineup is this sports model, Signet 200.

What's News In Plastics...

Escon® polypropylene  offers molders  a balanced  combination of properties for a wide range of molding applications such as high strength and impact resistance in automobile dash boards  ...excellent electrical  properties for cable connectors  ...high heat distortion temperature in vaporizers  ...low water pick-up in distributor caps  ... outstanding dynamic fatigue resistance for "living hinge" in accelerator pedals  and snap-fit closures →  for containers...outstanding chemical  resistance plus high gloss, surface hardness, and quality "feel" in dinnerware  . All available for volume production at low  cost.

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MEN IN THE NEWS

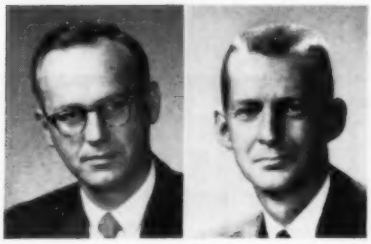
B. F. Goodrich Tire Co. — William H. Campbell has been appointed general manager, dealer sales.

National Lead Co., Doehler-Jarvis Div. — Alfred F. Bauer has been promoted to manager.

Oakite Products, Inc. —Robert P. Jones has been assigned to New York headquarters staff.

Air Reduction Sales Co.—G. L. Werly, Jr., has been promoted to general marketing manager.

Genaral Motors Corp., Chevrolet Motor Div. — James W. McLernon has been appointed assistant manager, Manufacturing Research and Development Dept.



General Motors Corp., Chevrolet Motor Div.—Howard H. Kehrl (far left) has been appointed quality control manager and George A. Brundrett has been named production superintendent at Janesville, Wis., plant.

Firestone Tire and Rubber Co.— **Dr. John Gordon Davoud** has been appointed executive vice president, Firestone Plastics Co. and Firestone Synthetic Fibers Co.

Ford Motor Co., Engineering Staff —**Jesse W. Richards** has been appointed director of the Technical Analysis Office; **Philip H. Pretz** has been named director of the International Office, and **Victor Hopeman** has been promoted to director of testing operations.

Goodyear Tire & Rubber Co.— **John P. Kelley** has been appointed advertising director.

Borg-Warner Corp., Borg & Beck Div.— **Harold Nutt** has been elected chairman and chief executive officer.

Joseph T. Ryerson & Son, Inc.— **William J. Kalt** has been promoted to general superintendent of the St. Louis plant.

Tidewater Oil Co.— **R. Jack Hawes** has been promoted to superintendent of technology.

Allis-Chalmers Mfg. Co., Industries Group— **T. D. Lyons** has been promoted to vice president, administration.

Ford Motor Co.— **James W. Ford** has been appointed manager of the Economic Analysis Dept.

General Motors Corp., GMC Truck & Coach Div.— **R. E. Field** and **D. J. LaBelle** have been named assistant chief engineers for trucks and coaches, respectively.

Hughes Aircraft Co.—**Dr. Lester C. Van Atta** has been named technical director of research laboratories.

General Motors Corp., Chevrolet Motor Div.—**Myron K. Saul** has been named superintendent-plant engineer at Warren, Mich.

General Motors Corp., Defense Systems Div.— **Dr. Isidore Hodes** has been appointed head of the Plasma Physics Laboratory.

Thompson Ramo Wooldridge, Inc., International Div.— **Henry T. King, Jr.**, has been appointed assistant to the vice president.

Ford Motor Co., Steel Div.—**Nicholas E. Rothenthaler** has been promoted to general manufacturing manager.

Ford Motor Co., Autolite Div. — **Harry L. Swan** has been promoted to advertising manager.

Dana Corp.—**W. H. Schomburg, Jr.**, has been promoted to general sales manager.

Borg-Warner, Ltd.—**E. S. Russey** has been elected chairman.

Gar Wood Industries, Inc., Hydraulic Div.—**William E. Van Horn** has been named sales manager.

Necrology

W. Hurst Montee, 69, former plant manager of the Budd Manufacturing Co., died Sept. 12 in Detroit.

John Warren Watson, 78, founder and president of the American Bronze Co., who was credited with developing one of the first automobile hot water heaters, died Sept. 8 in Bryn Mawr, Pa.

Dr. Leonard W. Doolan, 54, manager of Tidewater Oil Co.'s Eastern Div. lubricants supply department, died Sept. 3 in Scotch Plains, N. J.

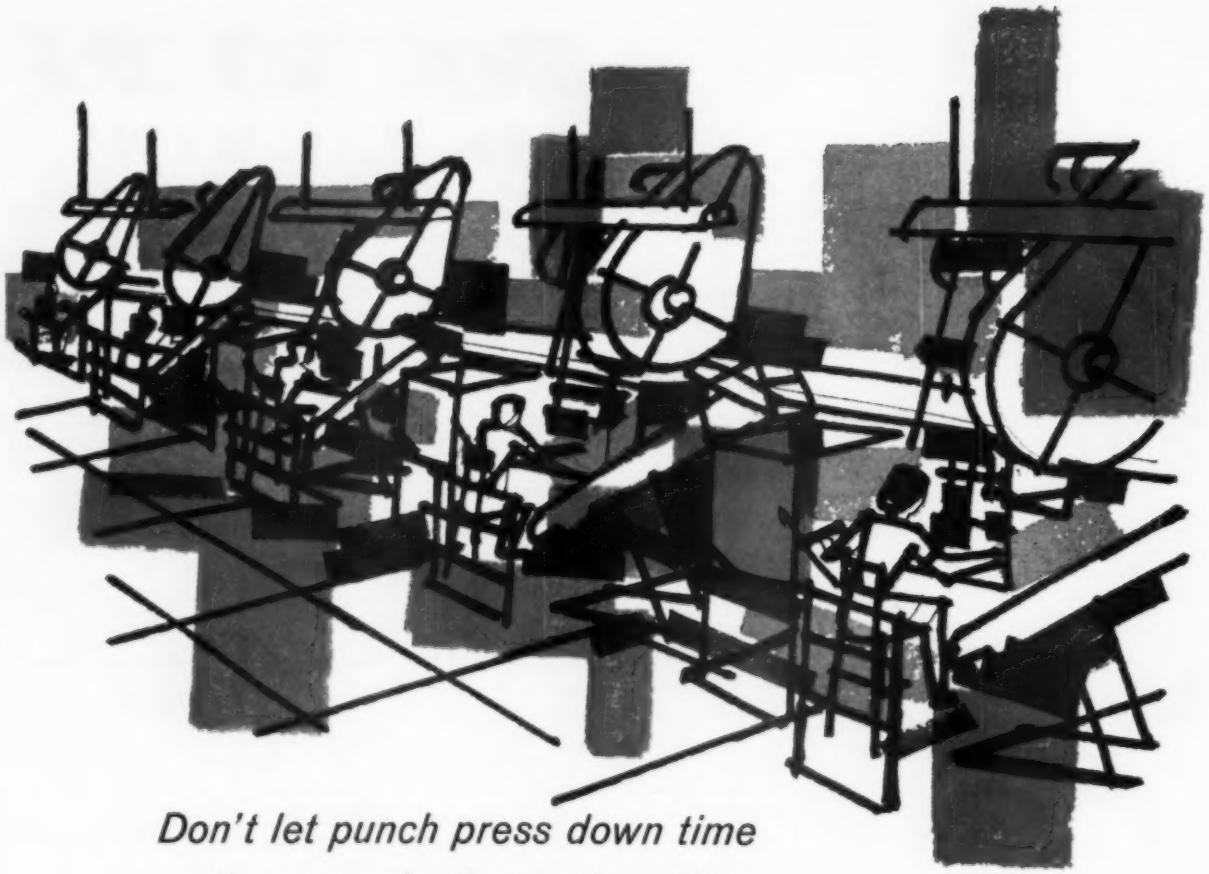
Lawrence Fisher, 73, one of the seven brothers who founded the Fisher Body Corp. in 1908 and who later became a General Motors vice president and president and general manager of the Cadillac Div., died Sept. 3 in Detroit.

Robert E. Gross, 64, board chairman of Lockheed Aircraft Corp., died Sept. 3 in Santa Monica, Calif.

James F. Struck, 60, manager of the product information section of General Motors Overseas Operations Div., died Sept. 3 in Detroit.

Hugh Dean, 72, retired vice president in charge of General Motors Corp. manufacturing staff, died Sept. 2 in Detroit.

Otto R. Reller, 72, vice president-production of Moline Tool Co., died Aug. 22 in Moline, Ill.



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an Editorial

Factory Expansions Predicted for 1962

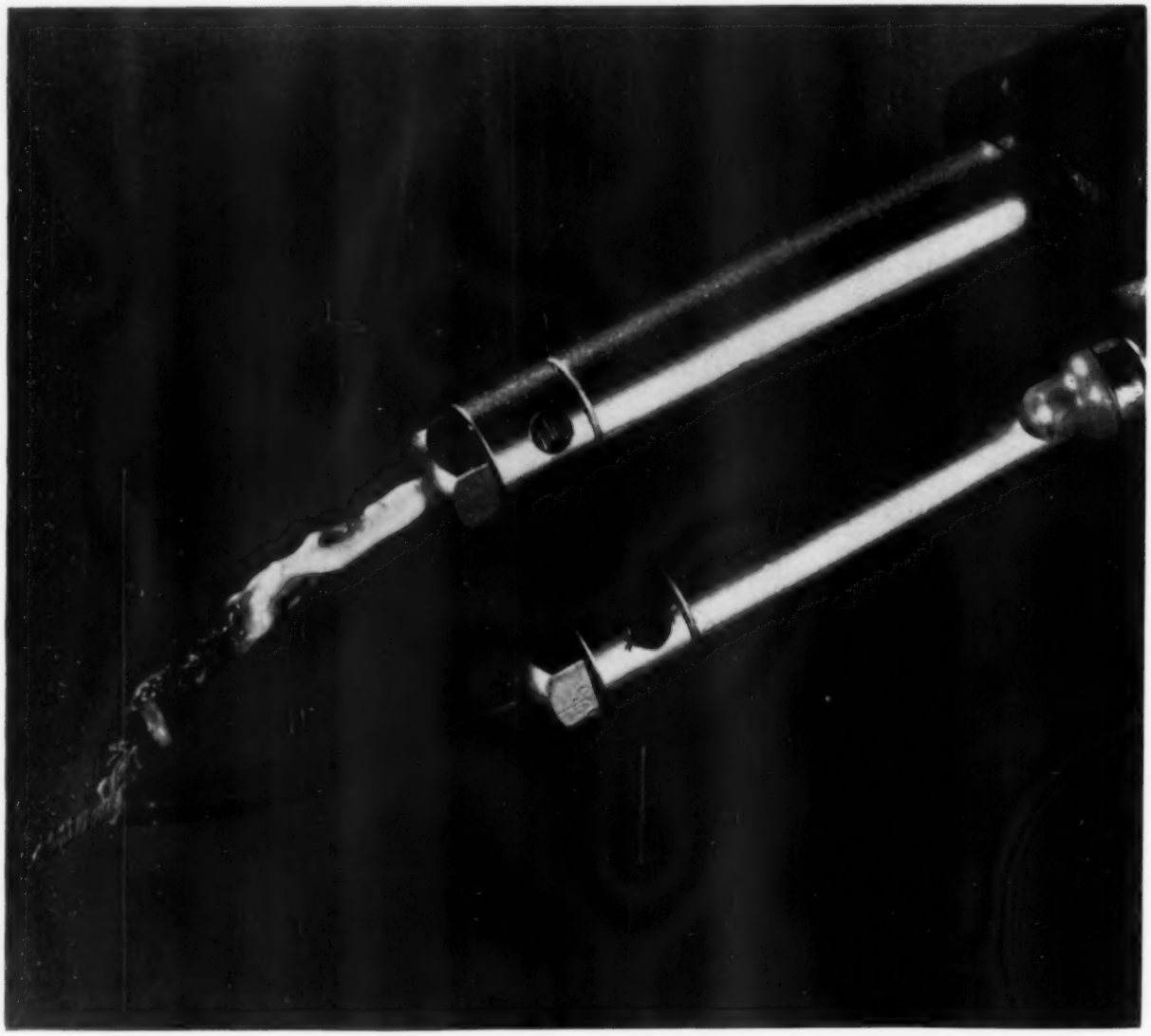
WITH THE INTRODUCTION OF THE 1962 models well under way and appraisals of the outlook for 1962 now being made freely by analysts, it is interesting to see that opinions now point toward general expectation of a near-record year for the automotive producers of the United States. Many such opinions have been reported in the newspapers, while others are quoted in specialized trade and financial publications. There seems to be a general unanimity of sentiment that both sales and profits will be up during the next year. Part of this sentiment is based upon the fact that industrial output in all lines has moved into new high ground for the whole country.

ONE OF THE BEST ANALYTICAL SERVICES providing specialized studies of individual industries is "The Value Line" investment survey. In its current report on the American machine tool industry, this service points out that the automobile industry is "expected to switch to the accelerator next year" in capital spending. Earlier they had reported their expectations of higher sales and profits for the automotive parts and components industries.

THE CAPITAL SPENDING FOR the automotive industries will include new plants and process equipment, as well as machine tools. Reports from engineers responsible for quality control and reliability reveal that many of the older installations of production equipment will have to be replaced with modern units in order to maintain the new and higher quality and reliability standards which have been established for 1962 production. The broad participation of the automotive industries in expansion of capital goods buying will further strengthen and reinforce America's total capabilities for national defense, as well as for making consumer products in greater variety, better quality and with increased utility and safety. It is therefore quite appropriate that the automobile manufacturers view their future with quiet and assured confidence as they enter into the new activities of the 1962 model year.

Hartley W Barclay

Editor and Publisher



In this overload test, tip of soldering gun has been replaced by primary wire jacketed with two different materials . . . one HYPALON and one a competitive product. Both wires are 18-gauge, and the wall thickness of each jacket is .037 inches.

Which primary wire is HYPALON® jacketed?

In this soldering gun test on primary wire, the black HYPALON synthetic rubber jacketing is unaffected while its counterpart, a thermoplastic material, melts away.

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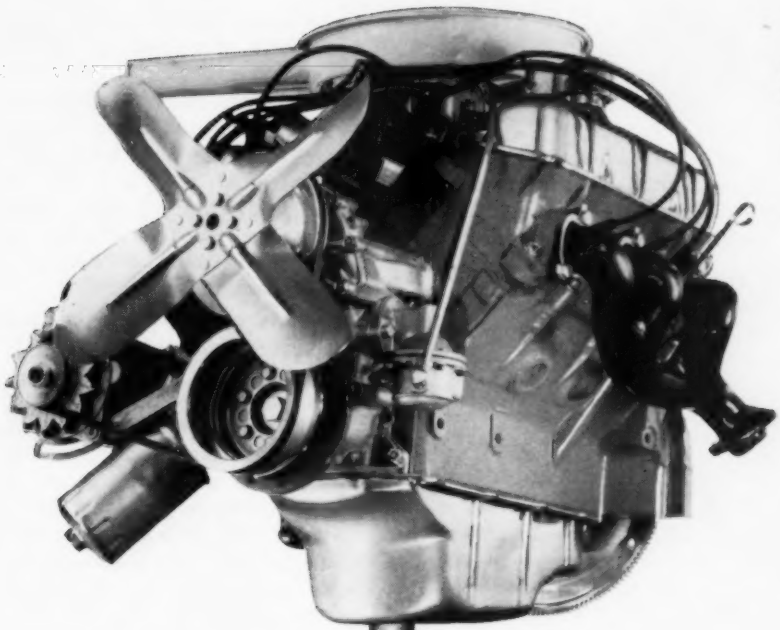


Left front quarter view of the Buick V-6 engine

BUICK.. *introduces* a V-6 ENGINE

By Joseph Geschelin
DETROIT EDITOR

FROM the standpoint of novelty, the outstanding contribution made by Buick for the 1962 model run is the introduction of the 90-deg V-6 engine which is standard equipment in the regular series Specials. Brief mechanical data will be found in the engine table.

So far as we can learn this is the first example of its kind in the motor car field and represents a distinct "first" for Buick. Almost 10 years ago General Motors Research was engaged in the development of a 60-deg V-6; also did some work with a 120-deg V-6.

To complete this introduction, it is pertinent to note that European V-6's of the past and in current production have been of the 60-deg or 120-deg configuration. Up to now, so far as we can learn, Buick is the first to consider the 90-deg V-6, certainly the first to place it in production. Finally, it must be remembered that GMC Truck & Coach Division has been building a heavy duty gasoline truck engine of 60-deg V-6 type for several years (see AI, August 15, 1959, for details).

Although the V-6 undoubtedly is the big promotion story for Buick, from a management standpoint there is much more to the story than appears on the surface. The big story for management and engineering and manufacturing is found in the advance planning for this project. Any new engine program today involves an enormous outlay for equipment and tooling; and it is sometimes difficult to justify this expense; certainly it has been difficult during the past few years as machine tool builders will testify.

Without attempting to picture a time-table of events, suffice it to say that the engine designers studied the V-6 configuration from all angles, and decided definitely to cast their lot with a 90-deg layout. It represented the simplest and most compact design, shorter than a 60-deg V-6, with the possibility of producing an extremely strong and rigid structure when employing the short, stiff, three-throw crankshaft.

Several questions remained to be resolved. First of all, there was the matter of establishing the best firing order out of several choices. Then there was the question of the net effect of unequally-spaced power impulses—coming at 90-deg and 150-deg intervals. No one had tried this design before and no one knew the answers positively.

So Buick engineers built a six-cylinder engine, using one of the 90-deg V-8 blocks. After some trials they settled on the final firing order—1, 6, 5, 4, 3, 2. With the three-throw, 120-deg crank spacing, this firing order means that successive firing skips from one bank to the other. Not only did this prove to be satisfactory but it was found that the non-symmetrical power impulses, amounting to a uniform 240-deg sequence for the cylinders on each bank, resulted in a smoothly running engine, free from vibration. At a matter of fact, it was concluded that power output was quite comparable with the 215-cu in. V-8, better than the power output of an inline Six.

Cutaway view of the new Buick V-6 engine as shown enlarged on the cover of this issue

This preliminary research effort proved without a doubt that Buick was on the right track. And this inevitably led to an economic study that would gain management approval.

The approach to the problem and its solution was brilliantly executed. First of all, the V-6 was visualized as being a design counterpart of the aluminum V-8. From this the group proceeded most logically to incorporate in the V-6 every piece and component of the V-8 that could be employed.

The production engine bears solid proof of the soundness of this advance planning. If we take the major parts that must be unique to the V-6: the cylinder block, cylinder head, crankshaft, camshaft, piston and rod assemblies, distributor, and manifolding; we have just about listed the parts that are not interchangeable with the 215-cu in. V-8.

Parts interchangeable with the V-8 include: the entire valve train, including rocker arms and brackets; valves and hydraulic lifters and associated small parts; timing gear drive; fuel pump and oil pump; water outlet; main bearing caps and bearings; and electrical equipment, except the distributor.

Even the aluminum front cover assembly with the water pump, oil pump and fuel pump and filter are interchangeable, except for a special aluminum oil pump cover which was required to take care of a clearance problem with the filter.

When this program was presented, it was a quick sale. For it meant that new tooling would be required only for the major components. The bulk of the smaller parts would be obtained simply by increasing production runs scheduled for the V-8.

Design philosophy, as mentioned earlier, is the same as for the 215-cu in. V-8. In fact, the only difference is that the combustion chamber, which is machined for the V-8, is used in the "as-cast" condition on the V-6.

This will be obvious from an examination of the transverse cross-section of the V-6, reproduced here from the assembly drawing. This drawing, as well as supplementary photographs, show the extremely compact nature of the structure. The four-bearing, counterweighted crankshaft is very short, stiff and rigid. Pistons are large in diameter and somewhat different in design detail. For example, they employ an offset piston pin —while the V-8 does not—and there is a relatively deep dish in the head.

Taking advantage of advanced techniques in the Buick foundry, both the cylinder block and head are produced with greater precision than previously. Moreover, it was found feasible to employ cylinder block wall sections of only 0.150-in. in thickness, held uniformly. As a result, the V-6 with an automatic drive weighs only 46-lb more than a similar V-8 powerplant; while the V-6 with manual shift transmission weighs only 60-lb more. In the latter case, the increased weight stems from the need for a heavier flywheel to smooth out the torque impulses which are absorbed without difficulty by the automatic transmission.

Salutary by-product of the firing order for this engine—alternately from bank to bank—was the development of a unique intake manifold. Although it is a single casting, the branches for each bank are independent of the branches for the other bank. Thus, with a two-barrel carburetor, each barrel serves only one bank, except for the slight cross-over built into the carburetor. The manifold is exhaust heated.

Let us revert at this point to another possibly troublesome question, namely, the matter of balancing the 90-deg V-6 for a motor car installation. Crankshaft counterweighting can provide complete balance, except for the effect of the secondary rocking couple. Inherently, this engine has shake in the horizontal plane with a measurable displacement at the front and at the rear. GMC engineers had investigated the same phenomenon in connection with their 60-deg V-6 (see AI, August 15, 1959) and, as described in the article, found it could be absorbed by proper engine mounting.

Preliminary mathematical analysis at Buick gave the following figures for displacements:

0.0015-in. at the front engine mount
0.0023-in. at the rear of the engine
0.007-in. at the transmission extension

These values correlated fairly well with the GMC results.

Further experimental work proved that shake of this magnitude could be absorbed satisfactorily through the use of suitably soft engine mounts. This

(*Turn to page* 80, *please*)

1962 BUICK
90-DEG, V-6 ENGINE
Brief Mechanical Data
valve-in-head type

Bore (in.)	3.625
Stroke (in.)	3.20
Displacement (cu in.)	198
Compression Ratio	8.8 to 1
Bhp (max.)	135 @ 4600 rpm
Torque (lb ft) max.	205 @ 2400 rpm
Carburetor	Two-barrel
Fuel	Regular grade

1962 BUICK SPECIAL Series

Buick Special Convertible

PERHAPS the most dramatic feature of the 1962 Buick Special line is the introduction of a 135-bhp, 198-cu-in., 90-deg. V-6 engine used as standard equipment in the standard Special series. This marks the first time in the history of the industry—going back 30 years or more—that a V-type Six is available in regular production.

As usual Buick has made some interesting styling changes; offers a wider range of models; and introduces several new models. For example, the convertible in the standard and Deluxe series is new. The Skylark now is of pillarless type, a new body model for this run.

For the standard series the convertible is supplied with a manually-operated top. This is said to be something new in mechanism and is operated with ease. The power operated top is offered as standard only on Deluxe series. Sedan models have the rear seat moved rearward by 1½ in., providing more legroom.

The line-up of series and models is as follows: **Standard Special Series**—4-dr sedan; 2-dr thin pillar coupe; 4-dr station wagon in two-seat and 3-seat versions; convertible coupe. **Deluxe Special Series:** 4-dr sedan; 4-dr, two-seat station wagon; convertible coupe. **Skylark** — pillarless sport coupe.

ENGINE PROGRAM — As mentioned earlier, biggest news is in the introduction of the cast iron V-6 engine. Of 90-deg, V-type with 198-cu in. displacement rated 135-bhp, this engine is standard equipment on the standard Special series cars. Since the engine is entirely new, and a "first" in domestic production, the details of design will be treated in a separate article in this issue.

The 215-cu in. aluminum V-8 engine remains unchanged in mechanical detail and retains the same specifications as before. The "high performance" version has compression ratio upped to 11 to 1 and is rated 190 hp. It is standard on Skylark models, offered as an option on all other Special models. The two-barrel version, rated 155-bhp, is standard on the Deluxe Special models.

CHASSIS PROGRAM—Some of the chassis details are a continuation of running changes toward the end of the 1961 model run. Among these are: bumpers on front rubber isolation shear mounts are softer; a rubber-mounted transmission support, which started with Skylark, is used on all automatic transmission models; the rear upper control arm is made of heavier stock; variable pitch rear coil springs are used. In addition, there is a rubber-mounted propeller shaft center bearing support.

The Dana positive-traction differential now is offered as optional equipment. It is similar in design and operation to the larger unit used since 1959 on the larger Buicks.

Power brakes will be offered as optional equipment on Special models when equipped with automatic transmissions. The unit is of atmospheric-suspended design with vacuum reserve in a separate reservoir.

Another optional feature is a four-speed, fully-synchronized, manual transmission. Gear ratios are: 1st—2.54 to 1; 2nd—1.92 to 1; 3rd—1.51 to 1; 4th—direct; reverse—2.6 to 1.

Manual steering is unchanged, remains standard on these

(*Turn to page 76, please*)

The 1962 Buick Invicta

The 1962 Regular Buick Line

LeSabre, Invicta, and Electra 225

SOME distinctive styling changes, many engineering improvements, and other features characterize the regular 1962 Buick line—LeSabre, Invicta, Electra 225. One important note: the basic 401-cu in. V-8 now is standard, in several versions, for all series.

In appraising the line-up of regular models, note the following changes from last year: LeSabre convertible as well as Estate Wagons have been discontinued; the Invicta coupe is eliminated, but a three-seat Estate Wagon has been added; the entire Electra series is discontinued and all models combined in the new Electra 225 series.

Front seat belt anchors are supplied in all cars as standard.

The line-up of series and models is as follows:

LeSabre Series—2-dr, 4-window sedan; 4-dr, 4-window hardtop; 2-dr, 4-window hardtop; 4-dr, 4-window, thin pillar sedan

Invicta Series—4-dr, 4-window hardtop; 2-dr, 4-window convertible; 4-dr, 6-window Estate Wagon in two-seat and 3-seat versions

Electra 225—4-dr, 6-window thin pillar sedan; 4-dr, 6-window hardtop; 4-dr, 4-window hardtop; 2-dr, 4-window hardtop; 2-dr, 4-window convertible

ENGINES—The basic 401-cu in. engine now is supplied across the board on LeSabre as well as Invicta and Electra series. This eliminates the former 364-cu in. V-8, makes it possible to concentrate production on just one basic V-8. The LeSabre version uses a two-barrel carburetor with large venturis. LeSabre models also have the option of a regular grade fuel version at no extra cost. This has a compression ratio of 9 to 1.

A third engine option on LeSabre, the performance version, is the same engine that is supplied for Invicta and Electra.

Although the 401-cu in. remains about the same from a mechanical standpoint, numerous refinements and improvements have been included for 1962. For one thing this engine has a redesigned water pump, fan pulley, and fan spacer. Fan pulley offset is reduced, and the assembly shortened for added stiffness. The camshaft too is new, providing for smoother and quieter engine idle.

Aluminum has been employed extensively in 401-cu in. engine and the 1962 version also adds an aluminum oil pump body. This brings the total of aluminum engine parts to 25 lb.

By redesigning cast iron parts to reduce wall thickness overall engine weight has been further reduced. The 1962 engine weighs only 638 lb dry.

The exhaust system has been redesigned for simplicity and tuned for added quietness. The single exhaust system is standard on all regular sized cars. The dual exhausts system, optional on all three regular series, except Estate Wagons, incorporates a resonator in the forward section of each exhaust line. Both the single- and dual-exhaust systems use the transverse muffler.

CHASSIS—The chassis frame for the regular sized cars is of the same design as last year, but has been widened at the front end. The new models have a lower front floor pan incident to moving the engine about 4 in. forward. The wider frame provides clearance for the relocated engine; also permits use of simplified exhausts pipes since there is more clearance around the engine.

Forward relocation of the engine has resulted in some changes in the front suspension system. The front spring support cross-member is revised, providing for relocation of the lower control arm pivot points, and employing shorter upper control arms.

LeSabre and Invicta models have an inboard-mounted recirculating ball-nut manual steering gear as standard equipment. Overall steering ratio is 33 to 1.

An inboard-mounted power steering gear unit is standard on Electra 225, optional on LeSabre and Invicta.

Turbine drive is continued as standard equipment on all models. It has a revised shift linkage to accommodate the lowered floor tunnel. ■

1962 BUICK ENGINES

LeSabre, Invicta, Electra 225

90-deg V-8, valve-in-head

	LeSabre	Invicta Electra 225
Bore (in.)	4.1875	
Stroke (in.)	3.64	
Displacement (cu in.)	401	
Compression ratio	10.25	
Bhp (max.)	280 @ 4400	325 @ 4400
Torque (lb ft) max.	424 @ 2400	445 @ 2800
Carburetor	Two-Barrel	Four-Barrel
Fuel	Premium	

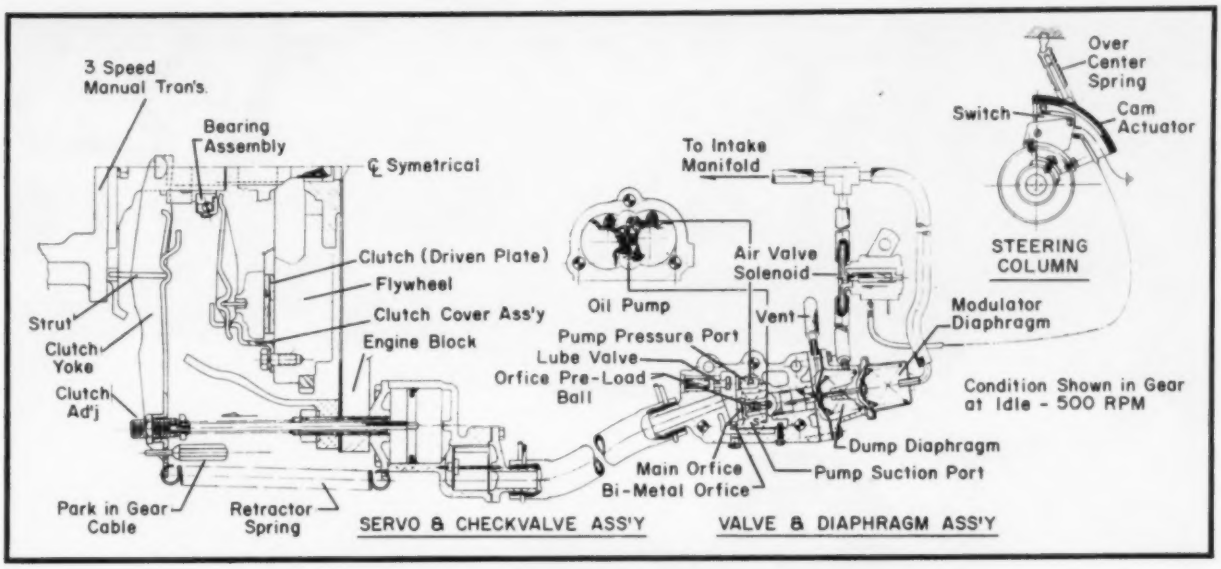


Fig. 2—Schematic diagram of the E-Stick shift control

American Motors Offers *NEW SHIFT CONTROL* for Manual Transmissions

AMERICAN Motors' 1962 American Models offer the "E-Stick" shift control in conjunction with a standard manual shift transmission with or without optional overdrive. The E-Stick drive employs a version of the conventional clutch without clutch pedal, providing a good approach to the convenience of an automatic drive, coupled with the economy of the manual transmission. Although its price has not yet been announced, the cost of the E-Stick drive is approximately one-third that of an automatic transmission.

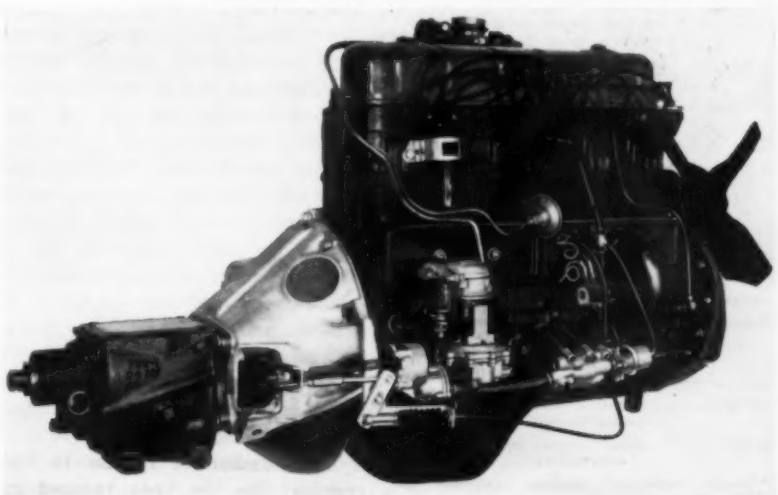
The clutch employed with E-Stick drive has a conventional disk and pressure plate but, unlike the conventional clutch, it is normally in released position and must be actuated for engagement. Being in released position when at rest, this clutch has no thrust springs or centrifugal weights, and is simpler and thinner than a conventional clutch. On the other hand, it is equipped with a manual park-in-gear control for locking securely when the car is parked.

It is obvious, therefore, that E-Shift requires an automatic means for engaging the clutch during the operation of the car. This is accomplished by a combination of engine oil pressure and intake manifold vacuum.

How this is done may be understood by examining the illustrations. The photograph below shows the added attachments to the engine, corresponding to the diagram above.

Engine oil pressure, supplied by the geared oil pump seen in the diagram, is utilized to apply the clutch in response to engine speed and torque, providing a smooth start similar to that of an automatic transmission. Following engagement, clutch pressure is maintained and controlled by manifold vacuum. (*Turn to page 77, please*)

Fig. 1—Power plant equipped with the E-Stick shift control



Chevrolet Impala Sport Coupe

Chevrolet's Regular Lines of Passenger Cars for '62

1962 CHEVROLET SERIES AND MODELS

SERIES	MODEL
BISCAYNE	2-Door Sedan, 6-Pass.
	4-Door Sedan, 6-Pass.
	4-Door Station Wagon, 6-Pass.
BEL AIR	2-Door Sedan, 6-Pass.
	4-Door Sedan, 6-Pass.
	2-Door Sport Coupe, 5-Pass.
	4-Door Station Wagon, 6-Pass.
	4-Door Station Wagon, 9-Pass.
IMPALA	4-Door Sedan, 6-Passenger
	2-Door Sport Coupe, 5-Pass.
	4-Door Sport Sedan, 6-Pass.
	2-Door Convertible, 5-Pass.
	4-Door Station Wagon, 6-Pass.
	4-Door Station Wagon, 9-Pass.

CORVAIR MODEL IDENTIFICATION

Corvair 500	2-Door Coupe, 5-Pass.
Corvair 700	2-Door Coupe, 5-Pass.
	4-Door Sedan, 6-Pass.
	4-Door Station Wagon, 2-Seat
Corvair 900 (Monza)	2-Door Coupe, 4-Pass.
	4-Door Sedan, 6-Pass.
	4-Door Station Wagon, 2-Seat
R-12 *	4-Door Station Wagon, 6-Pass. (Greenbrier)

* Custom equipment package available as single option (RPO 431).

BIGGEST news at Chevrolet for 1962 is the introduction of the long-awaited addition to the line—the Chevy II—which is available with either the new four-cylinder or six - cylinder engine. Since Chevy II is entirely new in every detail, this article is devoted to a round-up of features of the regular line, while the Chevy II is treated separately in the same issue of AI.

The regular line, the full sized Chevrolet models, features fresh eye appeal with new roof styles for pillar sedans as well as the Impala Sport Coupe. Below the belt line, with the exception of door panels, all body outer panels are new. An interesting feature is a new fender skirt design which is said to prevent corrosion of inner fender surfaces.

The number of models in the regular line has been reduced to 14, as compared with 20 models last year. Besides the elimination of models, the station wagon names —Nomad, Parkwood, and Brookwood—are discontinued. Instead, they become a station wagon model within the designated series.

Although the chassis remains basically the same, a noteworthy development comes from the introduction of a new engine—the 327-cu in. V-8—which replaces the well-known 348-cu in. V-8. A new Powerglide automatic transmission is offered for exclusive use with this engine. At the same time the Turboglide transmission has been discontinued.

Corvette appearance has been updated by new body side cove treatment as well as a new grille and emblems. The entire setup of power teams, the major factor in the selection of a personalized Corvette, has been changed. The new 327-cu in. V-8 engine now becomes the basis for all power teams. The new powerglide drive, with aluminum case and extension, is furnished as the automatic transmission option.

In the Corvair line, the four-door sedan and Lakewood station wagon in the 500 series have been discontinued. The 1962 models are

1962 Chevrolet Corvette

Corvair Monza 900 Club Coupe

more or less the same as the former line.

Corvair has special identification features for the '62 models. This includes an ornamental grille at the front, new emblems and ornamentation, and a new exhaust grille beneath the rear bumper. Colors and interior trim are new. Engine and chassis details remain basically unchanged. Two - ply low - profile tires, introduced mid-way in the '61 model run, are standard.

The new Powerglide transmission is similar, in function and general design, to the familiar two-speed Powerglide. However, the drive supplied with the 327-cu in. V-8 has an aluminum case and extension. Moreover, this drive is supplied in two different versions—one for the 327-cu in. engine on the regular line; and a more rugged version where specified on Corvette models.

ENGINES—Chevrolet's biggest story lies in the introduction of three new engines. The new four- and six-cylinder engines are described in connection with Chevy II. Here we shall concentrate on the 327-cu in. V-8. This engine is similar in design detail to recent Chevrolet V-8's. Both the 409-cu in. V-8 and the 327 have premium aluminum main and connecting rod bearings. Both engines are fitted with a rubber - mounted inertia damper; and are supplied with a thermo-modulated viscous type fan as standard equipment.

Pistons for the 327-cu in. engine are of cast aluminum, with flat head and notched. Pistons for the 409, as well as the high performance version of 327 for Corvette, are impact extruded aluminum.

The positive traction differential is offered on all models in all series. ■

1962 CHEVROLET ENGINES

Engine Description Bore & Stroke	Gross Horsepower & Torque	Equipment	Comp. Ratio
235 cu in. L-6 Hi-Thrift 235 3.56 x 3.94	135@4000 217@2000 2400	Single Bbl. Carb. Hyd. Lifters	8.25:1
283 cu in. V-8 Turbo-Fire 283 3.88 x 3.0	170@4200 275@2200	2-Bbl. Carb. Hyd. Lifters	8.5:1
327 cu in. V-8 Turbo-Fire 327 RPO 300 4.00 x 3.25	250@4400 350@2800	4-Bbl. Carb. Hyd. Lifters	10.5:1
327 cu in. V-8 Turbo-Fire 327 RPO 397 4.00 x 3.25	300@5000 360@3200	Large 4-Bbl. Alum. Carb. Hyd. Lifters	10.5:1
409 cu in. V-8 Turbo-Fire 409 RPO 580 4.313 x 3.50	380@5000 420@3200	Large 4-Bbl. Alum. Carb. Spec. Camshaft Mech. Lifters	11.0:1
409 cu in. V-8 Turbo-Fire 409 RPO 587 4.313 x 3.50	409@6000 420@4000	Two 4-Bbl. Alum. Carbs. Spec. Camshaft Mech. Lifters	11.0:1

1962 CORVETTE ENGINES

327 cu. in. V-8 Base Engine 4.00 x 3.25	250@4400 350@2800	4-Bbl. Carb. Hyd. Lifters	10.5:1
327 cu in. V-8 RPO 583 4.00 x 3.25	300@5000 360@3200	Large 4-Bbl. Alum. Carb. Hyd. Lifters	10.5:1
327 cu in. V-8 RPO 396 4.00 x 3.25	340@6000 344@4000	Large 4-Bbl. Alum. Carb. Spec. Camshaft Mech. Lifters	11.25:1
327 cu in. V-8 RPO 582 4.00 x 3.25	360@6000 352@4000	Fuel Injection Spec. Camshaft Mech. Lifters	11.25:1

*—3.08:1 axle ratio available optionally.

1962 CORVAIR ENGINES

145 cu in. Opposed-6 Turbo-Air 145 3.438 x 2.6	80@4400 128@2300	Two Single Barrel Carbs. Hyd. Lifters	8.0:1*
145 cu in. Opposed-6 Turbo-Air 145 RPO 649 3.438 x 2.6	102@4400 134@2000 3000	Two Single Barrel Carbs. Hyd. Lifters Spec. Camshaft	9.0:1

*—On Monza models with Powerglide transmission compression ratio is 9.0:1, and power ratings are 84 horsepower @ 4400 rpm and 130 lb. ft. @ 2300 rpm.

**—Positraction axle ratios of 3.27, 3.55, and 3.89:1 available in the combinations shown.

The 1962 Pontiac Line

EXTERIOR and interior styling changes, improved engine performance, and numerous engineering changes are characteristic of the 1962 Pontiac line. The regular line of full-sized cars is offered in four series. The cars all are 1.6-in. longer than last year; and wheelbase has been upped by one-inch on the Catalina series.

Reliability, safety, and freedom from frequent service station hoist stops is accented in the 1962 models. For example: crankcase oil drain intervals now are on a 4000-mile schedule; chassis lubrication intervals have been upped to 35,000 miles under normal driving conditions; rear axle and manual transmission lube is good for the life of the car, while HydraMatic fluid changes are at 25,000 miles.

The line-up of Series and models is as follows: **Catalina**—on 120-in. wheelbase, two- and four-door sedans; two- and four-door hardtops; convertible; 4-dr, six- and nine-passenger station wagons. **Bonneville:** on 123-in. wheelbase, two- and four-door hardtops; convertible; 4-dr six-passenger station wagon. **Star Chief:** 4-dr hardtop; 4-dr sedan, on 123-in. wheelbase. Grand Prix: two-door sports coupe with special appointments and equipment, on 120-in. wheelbase. All station wagons are mounted on 119-in. wheelbase.

The basic 389-cu in. V-8 engine is used across the board for all series listed above with versions for regular fuel with low compression ratio; premium fuel with high compression ratios.

Although the basic engine remains substantially unchanged in mechanical components, an extensive improvement program has produced some salutary gains in the induction system. There are new intake manifolds with larger ex-

(*Turn to page 77, please*)

1962 PONTIAC ENGINE AND TRANSMISSION AVAILABILITY CHART

Disp.—389 cu in. Bore and Stroke—4.06 x 3.75. Type—90° V-8, In-Head

Series or Special Engine Description	Std. or Opt.	Trans-mission	Comp. Ratio	Carb.	Advertised Max. BHP	Advertised Max. Torque
Catalina and Star Chief	Std.	SM	8. 6:1	2 Bbl.	215 @ 3600	390 @ 2000
Bonneville	Std.	SM	8. 6:1	4 Bbl.	235 @ 3600	402 @ 2000
Grand Prix	Std.	SM	10.25:1	4 Bbl.	303 @ 4600	425 @ 2800
Std. Hydra-Matic Catalina	Opt.	HM	10.25:1	2 Bbl.	267 @ 4200	405 @ 2400
Std. Hydra-Matic Star Chief	Opt.	HM	10.25:1	2 Bbl.	283 @ 4400	413 @ 2800
Std. Hydra-Matic Bonneville	Opt.	HM	10.25:1	4 Bbl.	303 @ 4600	425 @ 2800
Std. Hydra-Matic Grand Prix	Opt.	HM	10.25:1	4 Bbl.	303 @ 4600	425 @ 2800
425 E Economy Eng. All Models	Opt.	HM	8. 6:1	2 Bbl.	230 @ 4000	380 @ 2000
4 Bbl. Carb. Catalina & Star Chief	Opt.	SM	8. 6:1	4 Bbl.	235 @ 3600	402 @ 2000
4 Bbl. Carb. Catalina & Star Chief	Opt.	HM	10.25:1	4 Bbl.	303 @ 4600	425 @ 2800
425-A All Models	Opt.	HDSM HM	10.75:1	4 Bbl.	333 @ 4800	425 @ 2800
425-A All Models	Opt.	HDSM HM	10.75:1	3-2 Bbl.	348 @ 4800	430 @ 3200
Tri-Power All Models	Opt.	HDSM HM	10.75:1	3-2 Bbl.	318 @ 4600	430 @ 3200

Legend: SM—Synchromesh Transmission. HDSM—Heavy Duty Synchromesh Transmission. HM—Hydra-Matic Transmission.

The new Bonneville two-door hardtop

THE NEW PONTIAC TEMPEST MODELS

Tempest convertible coupe

PONTIAC Tempest models have been groomed for 1962 with exterior and interior styling changes, improvements in performance, ride and handling, and increased durability. The line now offers five models: four-door sedan; four-door Safari station wagon; two-door coupe; two-door sports coupe; and a convertible coupe. Both the custom coupe and convertible are available with LeMans options, including bucket front seats.

From the standpoint of easier maintenance, Tempest models offer 4000-mile chassis lubrication intervals; 4000-mile engine oil change; and lubed-for-life distributor, rear axle, manual and automatic transmissions.

The basic Tempest engine remains 195-cu in. four-cylinder inline. There are five versions, offering a wide range of power, including a four-barrel carburetor option. The optional 215-cu in. aluminum V-8 is continued, with a rating of 185-bhp with a four-barrel carburetor.

As in the case of the larger V-8's, Tempest engines have been improved both in economy and in performance through changes in the induction system. The new streamlined intake manifolds have a larger exhaust-heated area together with special flow diverters to increase heating effect. They improve operating economy during warm-up because of the shortened choke-on interval. In the case of single-barrel carburetor engines, the carburetors have been calibrated to effect improved road level fuel economy as well. The air cleaner outlet has been enlarged as a further contribution to better breathing.

The intake manifold for four-barrel carburetor versions has been revised by the adoption of streamlined parallel runners to improve engine breathing, resulting in increased power output. In addition, the new manifold has a different geometry, designed to move the carburetor closer to the center of the engine.

The regular fuel engine for use with the automatic transmission has been revised with the introduction of a new camshaft and special valve lifters to increase horsepower and improve high speed performance.

Coming to chassis details, it is important to note that the ride has been made even softer by the use of a newly designed front suspension upper control arm insulator having a lower torsional rate. Lower control arm strut bushings also have been softened. Rear suspension geometry has been modified by tilting the rear axle control arm pivot axis three degrees to improve car handling. Front and rear shock absorber valving is revised for a softer ride.

An interesting change has been made in the bearings for the Tempest flexible drive shaft. This is found in the introduction of new rubber-mounted propeller shaft damping ball bearings, eliminating the former design which included retainers and clamp bolts.

The manual-shift, four-speed transmission now is synchronized in all forward speeds. Gear ratios are: 1st—3.65 to 1; 2nd—2.35 to 1; 3rd—1.44 to 1; 4th in direct; reverse—3.66 to 1.

Other chassis improvements include: new upper ball joints; brake shoes strengthened by increasing flange length; forward movement of the engine restricted by use of new mounts; and freedom from vapor lock effected by changing fuel line routing.

Axle ratios are determined by body type, optional equipment, and accessories. Available ratios are: 3.08 to 1, 3.31 to 1, 3.55 to 1, 3.73 to 1, and 3.9 to 1, including economy and high performance ratios.

Seat belt anchors for the front compartment are supplied as standard equipment. ■

TEMPEST ENGINE AND TRANSMISSION COMBINATIONS

Valve In-Head, 194.5 Cubic Inch
4 cyl In-Line Engine, 4.06 In. Bore, 3.75 In. Stroke

Std. or Optional	Transmission	Comp. Ratio	Carb.	Advertised Max. BHP	Advertised Max. Torque
Standard	Synchromesh	8.6:1	1 Bbl	110 @ 3600	190 @ 2000
Optional	Automatic	8.6:1	1 Bbl	115 @ 4000	195 @ 2200
Optional	Synchromesh	10.25:1	1 Bbl	120 @ 3800	202 @ 2000
Optional	Automatic	10.25:1	1 Bbl	140 @ 4400	207 @ 2200
Optional	Synchromesh or Automatic	10.25:1	4 Bbl	166 @ 4800	215 @ 2800
215 Cubic Inch V-8 Premium Fuel Engine Bore 3.50" Stroke 2.80"					
Optional	Automatic	10.25:1	4 Bbl	185 @ 4800	230 @ 2800

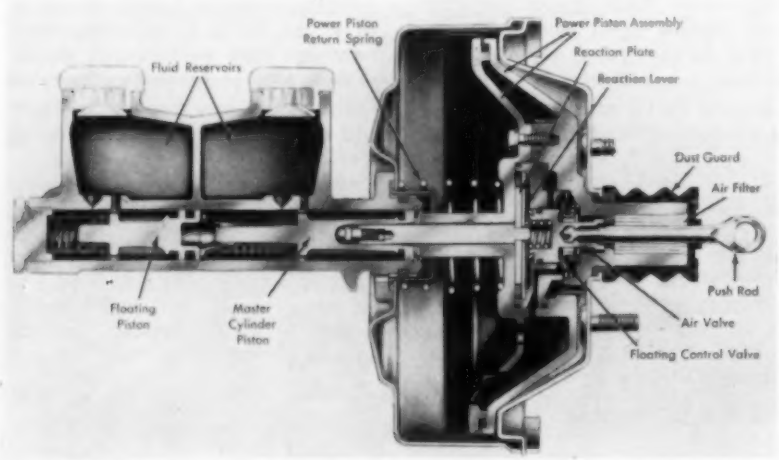
1962 Cadillac four-window Sedan de Ville

The New Cadillacs

Triple Brake System, with Dual-Type Power Brake Master Cylinder Among Cadillac's Features

TOP line in General Motors, Cadillac introduces its 1962 cars with distinctive styling changes, with a new body type—a four-door, four-window, close-coupled sedan — with important safety features, and numerous engineering improvements. Bodies have new sheet metal in the rear quarter section; while the styling theme is developed further in new front and rear bumpers and grilles. Bodies also incorporate a new idea in sound-deadening through the use of a special sheet rubber insulation added to the other deadening materials.

From the standpoint of safety, doubtless the most revolutionary feature is that of the triple brake system, to be described later. Heart of the system is a dual-type power brake master cylinder. The cars will have, in effect, three separate brake systems in an emergency.



Cadillac dual brake system

Another novelty is a cornering light system, actuated automatically when the light switch is on and the turn signal is used. This consists of a lamp on each fender side, mounted directly beneath the headlamp body. It throws a wide, powerful beam that spans the ground area around a turn.

Added safety within the front compartment comes from vinyl coating for the inside rear view mirror and the vanity mirror. They will not shatter upon violent impact.

As unusual tail lamp has been developed for the new line. It incorporates the bulbs for backing, brake warning signal, and turn signal and has a clear white lens. The lamp will show white for backing; but the stop light and turn signal show red. This stems from a system of white and red reflectors within the assembly, activated by reflection from the main reflector.

Front seat belt anchors are supplied as standard equipment.

Cadillac continues to provide an entirely lube-free chassis which does not require lubrication for the life of the car. Oil drain periods for HydraMatic vary with the type of service, normal drain period being at 16,000-mile intervals.

All models are mounted on a wheelbase of 129.5-in., except the Fleetwood series 75 which are on a wheelbase of 149.8 in.

The line-up of series and models is as follows: **Series 62**—Sedan; Town Sedan; coupe; convertible; Coupe de Ville; Sedan de Ville; four-window Sedan de Ville; short-coupled Sedan de Ville; Eldorado Biarritz. The Town Sedan and the short-coupled Sedan de Ville in this series employ the new four-window, four-door, close-coupled body and sheet metal, reducing overall length to 215-in. as compared with the standard overall length of 222-in.

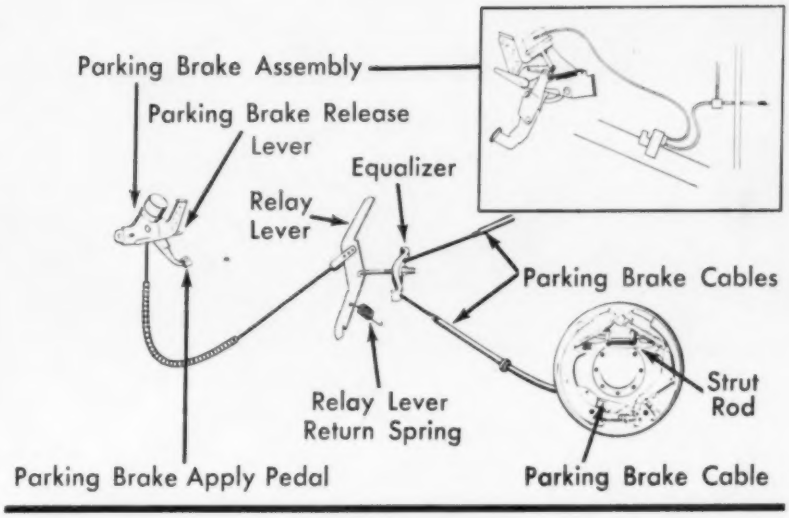
The rest of the line includes—the **Fleetwood Series 60**; and the **Fleetwood Series 75** which comes in eight-passenger limousine and sedan models.

From a mechanical standpoint Cadillac has introduced a host of detail changes to improve durability, to improve the ride, to reduce noise and vibration in the body and running gear.

Unquestionably, the major contribution to safe driving is the triple brake system on '62 Cadillacs and undoubtedly the first of its kind in the motor car industry. Heart of the brake system is a new dual-type power brake master cylinder. As illustrated, it has a separate piston and brake fluid reservoir for the front pair of wheels and for the rear set of wheels. In normal operation the brake system functions as a single unit. However, in the event of some accidental rupture or breakage of one of the hydraulic lines, only one pair of wheel brakes would be out of commission. In such instance, the fluid may well drain from the reservoir. However, drainage of one chamber does not affect the second chamber. This retains fluid at proper level, permits actuation of the intact pair of brakes to make the stop.

As further measure of safety, the parking brake can be employed as an emergency brake. This is made possible by the fact that the parking brake is so arranged that it will not lock, after actuation, while the car is in gear. Hence, one can apply the parking brake momentarily and it will release immediately.

The reliable 390-cu in. V-8 engine remains unchanged in specifications and in components. On the other hand, it is quieter in operation and has still better durability through a program of selective fitting of numerous parts, the latest being selective fitting of all main bearings to develop still closer fits.



Schematic illustration of the new emergency brake

The chassis frame has undergone considerable tuning as reflected in some changes in section thickness and other details. Body mounts have been revised, several of them removed, and some of them now are of natural rubber. An improvement has been made in the suspension system through the adoption of high hysteresis rubber at all points.

HydraMatic drive has proved so satisfactory that no important details have required change or improvement. Durability and quietness as well as smoothness of operation, however, accrue from manufacturing improvements.

The air conditioning system now employs a 6-cylinder compressor, of larger capacity in a smaller package. When air conditioning is specified, the installation includes a fan shroud as well as a special thermostatically-controlled fan. This fan has the added refinement that besides "off" and "on" control, it also has an intermediate control range.

Perfect Circule Cruise Control, which has been used for some time, is further improved by providing finer speed control through an easy-to-operate vernier knob.

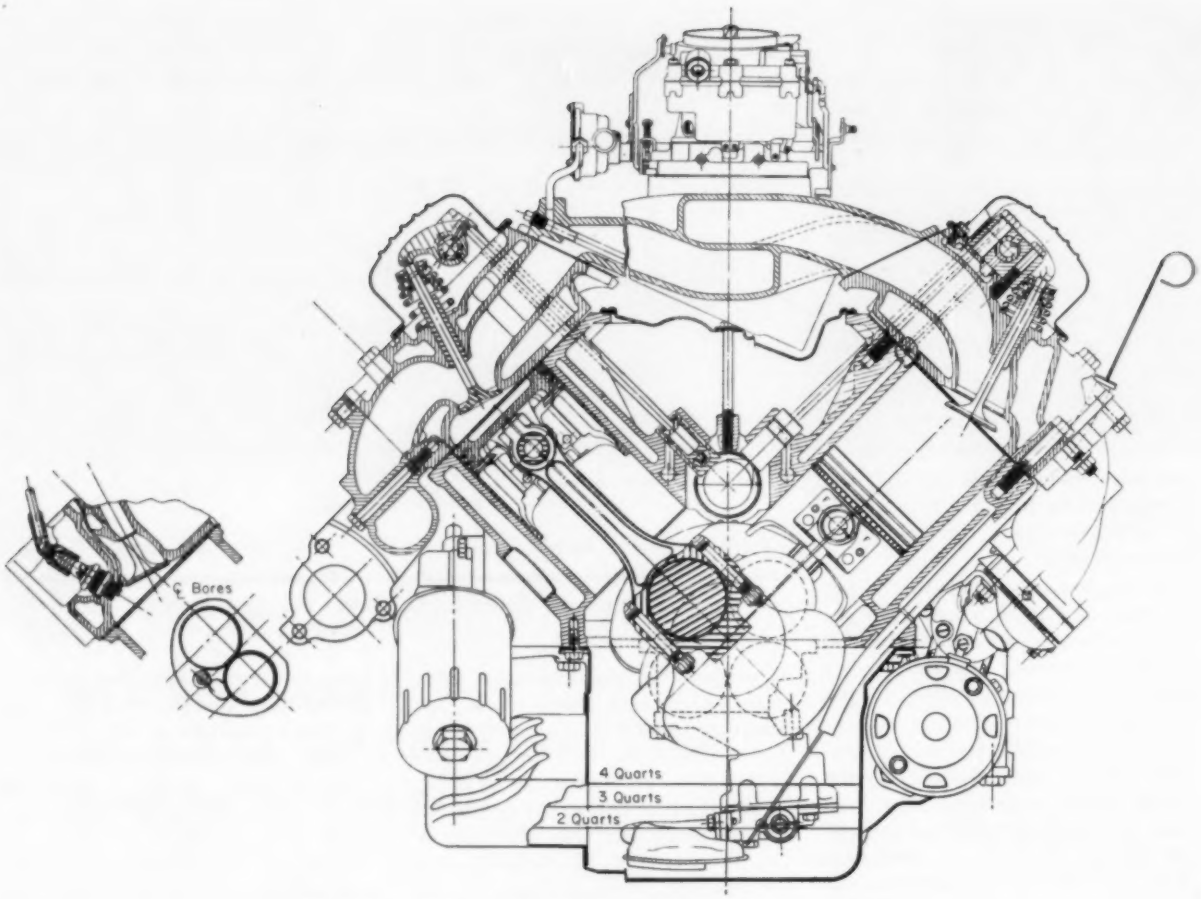
The trunk lock is new, and replaces the former power-operated lock. This lock is of mechanical type with positive closure by means of an oil cylinder. The mechanism, controlled from the instrument panel as in the former design, employs a vacuum release mechanism. ■

Volkswagen Unchanged

In keeping with past policy, the 1962 Volkswagen will be virtually unchanged in appearance. Larger taillights are the only outside changes which make the car distinguishable from the 1961 model.

Mechanical changes include an anti-smog device that vents crankcase fumes into the intake manifold. This device is offered as standard equipment. Also offered as standard are rear-seat heating, seat belt mountings, pneumatic wind-shield washer, fuel gauge and a reduced number of chassis lubrication points.

C. H. Hahn, general manager of Volkswagen of America, estimated the German import will sell 235,000 vehicles in this country in 1962. He predicted the imported car market in the United States will total more than 400,000 units next year.



Transverse sectional view of the 394 cu-in. Oldsmobile engine

Oldsmobile Adds Two New Models to 88 and 98 Series Line

STYLING changes — front and rear — a new roof development on certain models, and a straight top fender line, combine with two new body models and some important engineering changes to highlight 1962 full-sized car offerings at Oldsmobile. Added this year are the 98 Holiday Sport Sedan, and the Starfire Coupe which supplements the Starfire convertible. The 88 Series cars are on a wheelbase of 123-in., while the 98 Series has a wheelbase of 126-in. Tread is 61-in., front and rear on all models.

All chassis lubrication points now are factory-sealed and should not require attention for the life of the car under normal driving conditions. In addition, the generator and distributor have been revised so as to be lube-free. Another feature is that engine oil change intervals have been extended to 4000 miles, requiring a change in the oil filter element at the same time. Seat belt anchors are standard equipment. The closed crankcase ventilation system is available.

Seventeen body styles are offered in the new line as follows: **Dynamic 88-** 4-dr. Pillar sedan; 4-dr hardtop sedan; convertible coupe; 2-dr hardtop coupe; 4-dr station wagons in two-seat and three-seat versions. **Super 88:** 4-dr Pillar sedan; 4-dr hardtop sedan; 2-dr coupe; 4-dr, two-seat station wagon. **98 Series:** 4-dr Pillar sedan; 4-dr hardtop sedan in 6-window and 4-window versions; 2-dr hardtop coupe; convertible coupe. **Starfire:** convertible coupe; 2-dr hardtop.

From the standpoint of mechanical improvement much effort has been applied in many directions. Engine output, performance, and efficiency have been materially improved by the development of a new combustion chamber geometry, plus other detail changes. As shown in the illustration, the

Oldsmobile 98 Sport Sedan for 1962

combustion chamber has been rounded and streamlined while the depression in the piston head has been increased in volume. 1962 V-8's for the full-sized cars will employ just one standard cylinder head, will effect changes in compression ratio by revising the pistons.

The three center main bearings on the crankshaft have been lengthened to provide additional support and rigidity, resulting in quieter and smoother engine running. When the cars are equipped with air conditioning, Oldsmobile installs a 52-amp alternator in place of the usual generator.

A noteworthy feature of the brake system is the use of a self-adjusting mechanism on all full-sized cars when equipped with power brakes.

The Starfire coupe is equipped with front bucket seats and a sports type tower console. Standard equipment on both Starfire models includes: Hydra - Matic transmission, power steering, self-adjusting power brakes, and dual exhausts. Starfire cars are identified by a wide brush-textured aluminum insert band extending between the bright moldings from the front to the rear. It terminates at the front in a die casting.

Increased durability on full sized cars has been imparted by the adoption of tapered roller bearings at the wheels.

A die-cast zinc alloy grille, extending the full width at the front, is used in all full-sized cars.

Rear axle ratios: with manual transmission on 88's 3.23 to 1; with Hydra-Matic—2.56 to 1 on Dynamic 88; 2.87 to 1 on Super 88; 3.07 to 1 on 98. ■

Major Specifications

Engines for Oldsmobile's Full-Size Line

	Dynamic 88 Series	Super 88 Series	98 Series
Maximum Brake Horsepower	280 @ 4400 rpm	330 @ 4600 rpm	330 @ 4600 rpm
Maximum Torque	430 lb ft @ 2400 rpm	440 lb ft @ 2800 rpm	440 lb ft @ 2800 rpm
Displacement	394 cu in.	394 cu in.	394 cu in.
Bore	4⅛ in.	4⅛ in.	4⅛ in.
Stroke	3 11/16 in.	3 11/16 in.	3 11/16 in.
Compression Ratio	10.25:1	10.25:1	10.25:1
Carburetion	Dual Throat	4 Bbl.	4 Bbl.
Crankcase Capacity (with filter)	4 qts. 5 qts.	4 qts. 5 qts.	4 qts. 5 qts.

Super 88 and 98 engine available on Dynamic 88 at extra cost.
Low Compression engine (8.75:1) available on Dynamic 88 at no cost option.

The new Oldsmobile Starfire Coupe

The F-85 Sports Convertible, first convertible model offered in Oldsmobile's lower-priced series

Two Convertibles Added to Oldsmobile F-85 Line

ADDITION of two convertibles, sheet metal changes, and numerous mechanical improvements are features of the Oldsmobile F-85 for 1962. Contrary to uneducated guesses in the press Oldsmobile is producing only V-8 engines and continues the 215-cu in. aluminum V-8 on F-85 cars. The standard engine has the same specifications and ratings as before—155-bhp. The optional engine, fitted with a four-barrel carburetor and compression ratio of 10.25 to 1 is rated 185-bhp at 4800 rpm; 230-lb ft torque at 3200 rpm.

The 185-bhp V-8 is standard equipment on the F-85 Cutlass convertible and Cutlass coupe; the 155-bhp version is standard on F-85 models.

Styling changes include new front end and hood and restyled rear section. Almost two inches of additional room between front and rear seats of sedans has been provided for better passenger comfort. The new convertible model boasts a noteworthy feature, top operation is effected by means of a counterbalance which lowers the top with minimum manual effort.

Hydra-Matic, available as an option, has been improved by the adoption of pressure-compensating shift pattern which provides smoother transition between speed ranges. The manual shift transmission is standard. A softer, quieter ride stems from new shock absorber calibration and revisions in front suspension isolation mountings.

Extra-cost options on F-85 models include: power steering; and a special air conditioning unit featuring a six-cylinder compressor, providing greater capacity and quieter operation.

New headlining of all-vinyl plastic is being introduced in 1962 in seven of the F-85 models. The F-85 Cutlass Convertible offers a distinctive, textured white vinyl top, optional at extra cost.

A cushioned instrument panel and foam-padded front and rear seats are standard equipment in F-85 Deluxe models.

In addition to the newly-introduced convertibles, the Oldsmobile F-85 line includes for 1962: An F-85 four-door sedan; four-door, two-seat station wagon; four-door, three-seat station wagon, and a club coupe; an F-85 deluxe four-door sedan and a deluxe four-door, two-seat station wagon, and the popular Cutlass Sports Coupe. ■

OLDSMOBILE F-85 ENGINE SPECIFICATIONS

Cutlass 185 (Aluminum, V-8, Overhead Valve, 4-bbl Carburetion)

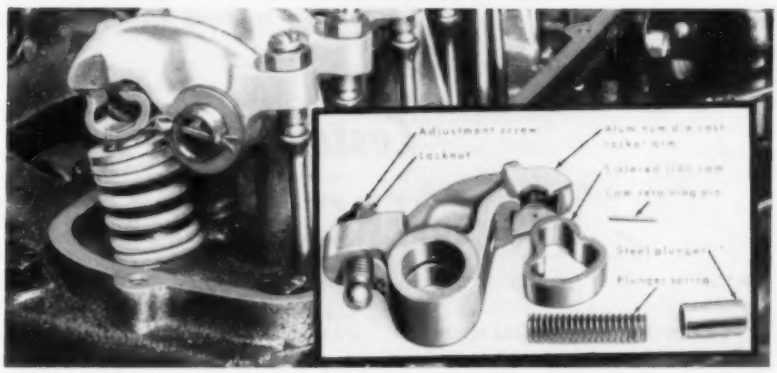
Maximum brake horsepower	185 @ 4800 rpm
Maximum torque	230 lb. ft. @ 3200 rpm
Compression ratio	10.25:1

Rocketto Engine (Aluminum, V-8, Overhead Valve, 2-bbl. Carburetion)

Maximum brake horsepower	155 @ 4800 rpm
Maximum torque	210 lb. ft. @ 3200 rpm
Displacement	215.0 cu. in.
Bore	3.5"
Stroke	2.8"
Compression ratio	8.75:1
Carburetion	Dual Throat—Econ-O-Way

Two-door Galaxie 500

The 1962 GALAXIE



The automatically-adjusting mechanical lash system used in the 223-cu in. six-cylinder engine. The inset shows the variety of components that make up the assembly.

In 1962 the Galaxie, available in 12 models in the Galaxie and Galaxie 500 series, is the top-of-the-line Ford car. Wheelbase is the same as last year—119-in. It now remains the only car in the Ford Division family with a separate body and frame. Engine options remain the same as last year.

Biggest news is in the extension of customer convenience features: 6000-mile oil change, 30,000-mile chassis and front wheel lubrication periods, and the new radiator coolant good for 30,000 miles or two years of operation. Seat belt anchors are standard equipment. Positive crankcase ventilation is available as optional equipment.

Special attention is given to the elimination of corrosion areas in the chassis mechanism, employing more nylon bushings to eliminate lubrication and wear; plating many parts to eliminate corrosion effects. Detail improvements were made in the three- and four-speed manual transmissions to reduce shifting effort.

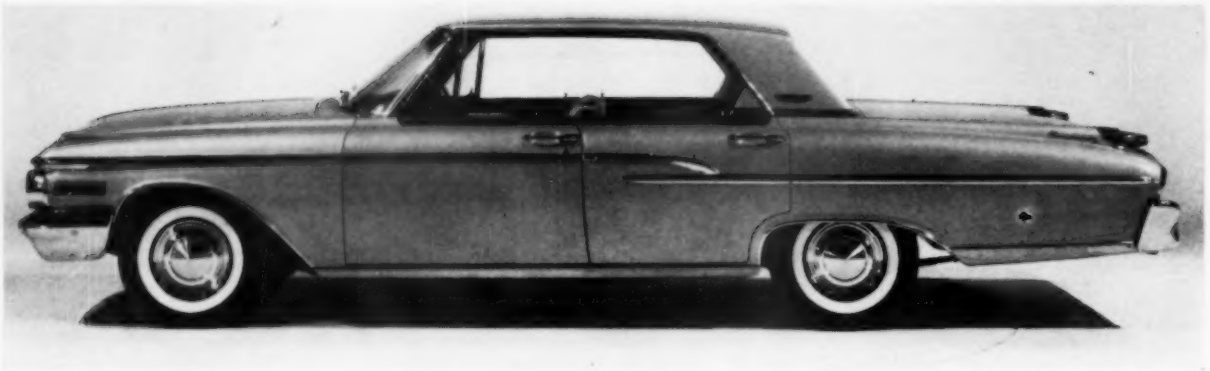
The line-up of models is as follows: Galaxie Series—two- and four-door sedans. Galaxie 500 Series—two- and four-door sedans; two- and four-door hardtops; two-door convertible. Station Wagons: four-door Ranch Wagon; four-door Country Sedan in 6- and 9-passenger versions; four-door Country Squire in 6- and 9-passenger versions. The former Starliner and two-door Ranch Wagon have been eliminated.

As mentioned earlier, the basic engine specifications remain unchanged and are presented in tabular form. However, many detail changes have been made to improve performance and durability. For one thing, on the 352 and 390 V-8 engines the exhaust heat riser valve has been eliminated and both engines have a water-warmed aluminum carburetor spacer installed between the manifold and carburetor. Elimination of the heat riser valve results in pulse heat in the crossover in place of continuous flow of exhaust heat. This reduces exhaust system back pressure, levels out the heat required for fuel vaporization. It also prevents overheating of the riser at high speed and during hot idling.

A distinctive feature of the 223-cu in. Six is found in the adoption of silent lash rocker arms—the mechanical equivalent of hydraulic valve lifter performance. Under de-

(*Turn to page 80, please*)

	PASSENGER CAR				STATION WAGON			
Transmission	Man.	O/D	Ford-O-Matic	Cruise-O-Matic	Man.	O/D	Ford-O-Matic	Cruise-O-Matic
223 6-Cyl.	3.56	3.89	3.56	—	3.89	3.89	3.56	—
292-2V-V8	3.56	3.89	3.00	3.00	3.89	3.89	3.56	3.56
352-2V-V8	3.56	3.56	3.00	3.00	3.56	3.56	3.00	3.00
390-4V-V8	3.56	3.56	—	3.00	3.56	3.56	—	3.00
390-4V-V8 Hi-Perf.	3.56	3.56	—	—	—	—	—	—



The new Monterey four-door hardtop

Custom Series Added To

The MERCURY MONTEREY Line

EXTENSIVE sheet metal changes as well as new decorative treatment at the front and rear characterize the Mercury Monterey (top line) for 1962. In addition, there is the introduction of the Monterey Custom Series. All cars in the Monterey line are mounted on a 120-in. wheelbase as before.

From the standpoint of operating economy, there are outstanding features of value to the car owner: 6000-mile engine oil change interval; 30,000-mile chassis lubrication interval; lifetime transmission and rear axle lubrication; 30,000-mile all weather coolant.

The line-up of models is as follows: **Monterey Series**—2-dr. and 4-dr. sedan; 2-dr. and 4-dr. hardtop; **Commuter Station Wagon**—4-dr. 6-pass. and 9-pass. versions. **Monterey Custom Series** — 4-dr. sedan; 2-dr. and 4-dr. hardtop; 2-dr. convertible; **Colony Park Station Wagon**—4-dr. 6-pass. and 9-pass. versions.

The cars are one-inch longer than the previous models; the roof line is four inches longer.

Engine physical specifications remain the same as last year (see AI, March 15, 1961, listing of standard and optional engines) except for some changes in ratings. The engine line-up includes the following models and indicates the changes: 223-cu in. Six —with bhp upped to 138 @ 4200 rpm, torque 203-lb ft @ 2200 rpm; 292-cu in. V-8 with bhp reduced to 170 @ 4200 rpm; 352-cu in. V-8 with bhp 220 @ 4300 rpm, torque rating at 2600 rpm. In addition there is the 390-cu in. V-8 Police Option version, rated 330-bhp @ 5000 rpm, torque 427- lb ft @ 3200 rpm.

Cushion-link suspension follows the same pattern as employed in the top Mercury line last year with the shackle link at the front pivot of the lower arm of the front suspension. A large elliptical rubber bushing surrounds the upper pin of the shackle, functioning as a shock absorber. The rear suspension incorporates a tension shackle of special design at the front anchor of the rear spring; and a tension shackle at the rear spring eye. The front shackle, mounted in rubber, has an extended arm which controls movement. Increased size of rubber in the shackle and rubber bushings reduces transmission of road noise.

A major change has been made in the lower ball joints of the front suspension. They are now spring-loaded to produce a secure assembly with automatic take-up for wear, thus providing spring-loaded ball joints both at upper and lower ends. In addition the lower ball joint includes a teflon washer.

Major improvement in the 223-cu in. Six is the adoption of a mechanical system of self-adjusting valve lash through the use of "Silent Lash" rocker arms. Rocker arms are made of aluminum castings and operate in conjunction with spring-loaded cam tappets. This system is claimed to give the same effect as with hydraulic valve lifters. Full vacuum distributor advance is provided.

On both the 352- and 390-cu in. V-8's the fuel-air-mixture is heated by means of a water-heated aluminum adapter between the carburetor and manifold, plus pulse heat from the exhaust system. The usual exhibit heat riser valve is eliminated. Exclusive feature of the intake manifold on both engines is the provision for isolating the manifold from the push-rod chamber. This barrier consists of a one-inch deep sealed air space effected by means of a steel plate covering the entire underside of the manifold. Intake and exhaust valves on both engines are arranged to alternate so as to prevent heat concentration. The distributor is mounted high in front. Spark advance is provided by a combination of cen-

(*Turn to page 77, please*)

The New Mercury Comet

1962 two-door Mercury Comet

THE Mercury Comet for 1962 features new sheet metal at the rear, a one-piece stamped aluminum front grille, and changes in styling treatment both in front and in the rear. General specifications remain unchanged. The basic 144- and optional 170-cu in. six cylinder engines have refinements to improve operation.

The line-up of models is as follows: **Comet** and **Comet Custom** series each have a two- and four-door sedan; and two- and four-door station wagons. The S-22 is available only as a two-door sedan. Altogether the Comet line now offers nine models.

Comet models offer an all-weather coolant good for 30,000 miles or two years of service; and 6000-mile engine lube change interval. Front seat belt anchors are supplied as standard equipment.

Bodies have been made more quiet by adding more sound deadening material in the hood, dash panel, front and rear floor, wheelhouse, package tray, instrument panel, cowl side and luggage compartment floor.

Numerous improvements have been made in mechanical components. At the front end, the front suspension ball joints have better provisions for grease retention and sealing out dirt and water. While the brake system remains the same, it now includes baffled wheel cylinders to eliminate brake "clunk." Brake drum finish has been improved to reduce shoe side movement.

The two Comet engines have cylinder blocks and cylinder heads of the new lightweight cast iron foundry technique, employing precision foundry methods (see AI, July 1, 1961). The intake manifold is cast integral with the cylinder head. Lubrication to the rocker arms and shaft has been improved.

Aluminum die castings are employed for a new engine front cover, carburetor mounting spacer, carburetor body, and fuel pump body.

Smoother operation of the engine is achieved by the adoption of a torsional vibration damper, and a redesigned crankshaft with revised center counterweight. The rear engine mount features an unusual design in the form of a cantilever leaf spring which absorbs and isolates vibrations from the passenger compartment.

Major improvements are found in the electrical system. There is a new 30-amp generator, claimed to give better service and quieter operation. It also embodies a new method of mounting to improve belt tension adjustment.

The single-venturi carburetor with automatic choke is completely new. A piston type accelerator pump provides better mixture control during acceleration. The float needle valve is fitted with a Viton plastic seat to eliminate clogging due to dirt. The float also is plastic, as well as the float anchor pin, to improve service.

Manual shift transmission hook-up has been improved in many ways. For example, Delrin bushings are added to the clutch linkage to eliminate noise, and reduce effort as well as the need for lubrication. Shift linkage has been revised and a longer shifter lever aids in reducing shifting effort. In addition, the three-speed transmission has improved synchronizers to make for easier shifting. The clutch linkage includes an interlock to prevent improper shifting with partially engaged clutch.

The muffler, which is four inches longer than last year, has aluminized interior baffles, galvanized steel outside construction. ■

2 Renault Dauphines

The second largest import seller, Renault, has reshuffled its lineup for 1962. There will be two Dauphines for next year priced slightly above and below the cost of the 1961 Dauphine. Prices on the other Renaults are generally the same.

The Carevelle will be offered only in the convertible model with the hardtop being dropped.

Next spring Renault will introduce a sports car to the Carevelle convertible series. The new car will feature disc - type brakes, higher horsepower, and a four-speed transmission.

Vincent Grob, executive vice-president and general manager for Renault, Inc., sees the import car market in the United States holding steady at about 400,000 units for the next few years. How that market will be broken up between the foreign producers will depend mainly on the service the import dealers can furnish their customers, he said.

Mr. Grob added that Renault sales in August represented one per cent of the total U. S. market, a percentage which has been Renault's target average for the year.

New Rambler American Models

Offer Automatic Clutch Transmission and Double-Safety Brake System

THE newest versions of American Motors' 1962 Rambler American models incorporate many advanced engineering features and mechanical improvements.

The 1962 line offers 12 models in a new Deluxe, Custom and 400 series. They include two and four-door sedans and station wagons, and a two-door convertible.

The optional all-new automatic clutch transmission, called "E-Stick," combines the economy of a manual transmission with the partial convenience of an automatic. This three-speed transmission completely eliminates the clutch pedal. It also is available with optional overdrive.

The E-Stick's clutch has a conventional disk and pressure plate which are engaged by levers, without requiring thrust springs or centrifugal weights. Engine oil pressure and intake manifold vacuum are combined to perform the function of operating the automatic clutch.

The driver simply engages the gears as if he were driving a standard transmission car, without employing any separate clutching action.

The completely new Flash-O-Matic automatic transmission, offered as optional equipment, is more compact and better suited for the power and torque output of Rambler's six-cylinder engines. It provides three-speed operation.

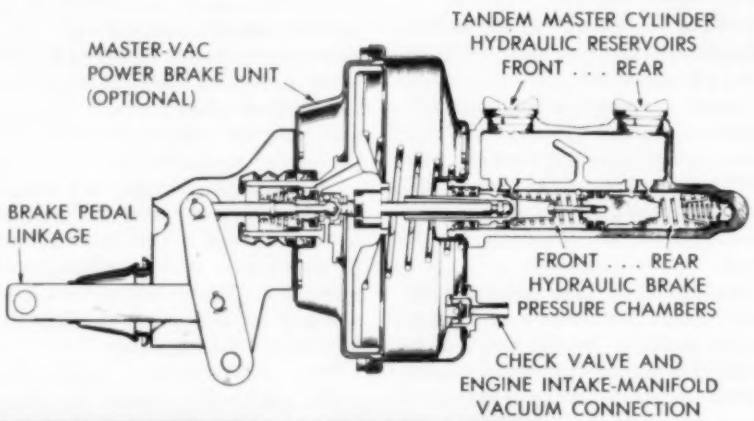
In addition to the E-Stick and Flash-O-Matic, the Rambler American also offers a standard synchromesh transmission and standard transmission with overdrive as optional equipment. In all, there is a choice of five transmissions on all American models.

An entirely new Double-Safety brake system is offered as standard equipment for the first time on all American models.

With the tandem brake master cylinder, the hydraulic system for the front brakes is completely separate from the rear brakes. In the event of hydraulic brake failure in the front, the rear hydraulic brakes still operate, and vice versa.

Self-adjusting brakes, previously

(*Turn to page 80, please*)



The "Double-Safety" brake system, standard equipment on all 1962 Ramblers, has a tandem master cylinder and separate hydraulic systems for front and rear brakes. The power brake unit is optional.

Rambler-American four-door sedan

Sport-styled "Gran Turismo" Studebaker Hawk

Studebaker's New Cars

Lark Daytona hardtop

Daytona Hardtop and Daytona Convertible Have Been Added to Line for '62

FRESH styling, a great deal of entirely new sheet metal, numerous mechanical improvements, and a realignment of wheelbases highlight the Studebaker Lark line for 1962.

Added to the Lark line are the Daytona Hardtop and the Daytona Convertible. The Daytona Series features bucket seats, console, and optional four-speed floor shift.

Styling and sheet metal changes, briefly noted, include new rear fenders—longer and lower; the deck lid is lowered and lengthened and has added a torsion bar hinge; the deck lower panel is new to accommodate new fenders, deck lid, and round tail lamps. The rear window is restyled—lowered and set farther to the rear.

Another styling improvement is the elimination of the "hump" in the belt line on the rear of sedans; and on the upper rear quarter panel of the two-door sedan, hardtop, and convertible.

At the front end the grille is of fresh design and extends farther forward. Hood contour has been changed to conform with the new styling theme. Dual headlamps now are standard on all Larks.

Seat belt anchors, supplied as standard equipment, are provided both at the front and rear.

Extensive detail changes and modifications have been made in engines and chassis. It is noteworthy that electrical equipment for all Larks is supplied by The Electric Autolite Co. Some of the features that worked so well on V-8's have been adopted on the Six.

Mufflers and muffler outlet pipes are of aluminized steel, the pipes being lengthened.

ENGINES — The 170-cu in. Six now has the following new features: water pump assembly with improved service life, has shaft shortened and slinger eliminated; a new rear support insulator and bracket for standard and overdrive

(*Turn to page 76 please*)

LARK CRUISER
luxury-styled four-door sedan
259 cu in. V-8 engine standard
289 cu in. V-8 engine optional
113 in. wheelbase
188 in. overall length

LARK DAYTONA SERIES
DAYTONA HARDTOP
DAYTONA CONVERTIBLE
Skybolt Six or 259 V-8 standard
289 V-8 optional
109 in. wheelbase
184 in. overall length

LARK REGAL SERIES
All Regal Models:
Skybolt OHV Six or 259 V-8 engines standard
289 V-8 engine optional

REGAL FOUR-DOOR SEDAN
113 in. wheelbase
188 in. overall

REGAL HARDTOP
REGAL CONVERTIBLE
109 in. wheelbase
188 in. overall

REGAL FOUR-DOOR STATION WAGON
113 in. wheelbase
187 in. overall

LARK DELUXE SERIES
All Deluxe Models:
Skybolt Six or 259 V-8 engines standard
289 V-8 engine optional

DELUXE FOUR-DOOR SEDAN
113 in. wheelbase
188 in. overall

DELUXE FOUR-DOOR STATION WAGON
113 in. wheelbase
187 in. overall

DELUXE TWO-DOOR SEDAN
109 in. wheelbase
184 in. overall

STUDEBAKER HAWK
Sport-styled "Gran Turismo"
Two-door hardtop
289 V-8 cu in. engine standard
120½ in. wheelbase
204 in. overall

1962 GMC 5000 Series highway tractor

GMC Trucks for 1962

For 1962, many GMC truck models, such as the 48-in. aluminum tilt cab models, 72-in. steel tilt cab units, and 90-in. "B" conventional models are being continued.

More powerful 305-cu in. V-6 engines will power all of GMC's light and medium trucks for 1962. Among five engines in GMC's V-6 gasoline engine family, the new 305's are said to combine improved fuel economy with increased horsepower. They were offered optionally last year.

A styling improvement for GMC conventional-cab models gives the driver a wider angle of vision over the front and sides of the hood. The hood contour has been lowered on all conventional cabs, including all light trucks plus heavier models having 105-in. cabs.

Beyond styling and engine changes, GMC has adopted larger, heavier transmissions in many heavy duty models.

There are also frame changes, front and rear axle changes, wiring harness improvements, new brakes on some models, and other mechanical refinements.

New instrument panels feature printed electrical circuits, and, for the first time, directional signals are standard.

A 305D engine replaces last year's 305A in model series 1000, 1500, 2500, 3000 and 3500. In the 4000 series trucks, a new 305C is used in place of the previous 305B.

The 305D has two-barrel carburetion and improved manifolding, resulting higher torque and horsepower.

While the 305D has non-rotating, chrome - nickel - molybdenum alloy steel intake and silchrome XB exhaust valves as standard components, positive rotating silchrome XB intake and silchrome-10, hard-faced exhaust valves are available.

The 305C engine, powering 4000 series models, has been substantially improved over last year's 305B.

Both the 305C and 305D have 1¼-in. duplex carburetors and one-piece, steel expander type oil control rings.

On 7000 series models powered by 702-cu in. V-12 engines, the previous two-plate, 14-in. solid disk clutch is replaced by a two-plate, 14-in. dampened disk. This helps assure quieter transmission operation.

The higher performance 401 V-6 gasoline engine now is an option in the tandem BWV5000 and BWA5000 series, and it is used with the 305V deep, low main transmission and the optional 6041 auxiliary.

The model B6000 now incorporates a heavy-duty 307V transmission. ■

INDUSTRY STATISTICS

By Marcus Ainsworth, STATISTICAL EDITOR

WEEKLY U. S. MOTOR VEHICLE PRODUCTION

As reported by the Automobile Manufacturers Association

Make	Weeks Ending Sept. 16	Weeks Ending Sept. 9	Year to Date 1961	Year to Date 1960
PASSENGER CAR PRODUCTION				
Total—American Motors	8,530	3,242	231,367	340,845
Chrysler	2,386	1,270	59,819	61,689
De Soto				17,035
Dodge	4,010	2,476	92,793	293,987
Imperial	300	241	5,019	10,443
Lancer	1,801	1,227	30,568	17,599
Plymouth	4,333	2,768	112,593	182,619
Valiant	3,103	2,201	77,784	189,169
Total—Chrysler Corp.	15,933	10,183	378,596	772,541
Comet	4,953	3,724	129,195	129,995
Falcon	13,651	10,149	354,979	362,449
Ford	15,156	10,024	553,131	684,828
Lincoln	789	632	20,223	13,194
Mercury	2,477	1,943	70,640	108,521
Total—Ford Motor Co.	37,026	26,472	1,128,168	1,298,987
Buick	281	3,335	114,635	185,354
Buick Special	147	1,558	56,262	3,100
Cadillac	127	2,705	97,538	110,913
Chevrolet	210	15,869	805,503	1,170,634
Corvair	1,097	6,859	230,074	173,132
Oldsmobile	358	4,363	151,736	260,426
Oldsmobile F-85	111	1,230	41,598	3,547
Pontiac	279	3,895	146,577	313,530
Tempest	101	1,759	76,656	46
Total—General Motors Corp.	2,711	41,573	1,720,579	2,220,682
Total—Studebaker-Packard Corp.	1,964	1,978	39,553	76,245
Checker Motors	97	94	4,016	5,267
Total—Passenger Cars	84,261	83,542	3,502,279	4,714,507
TRUCK AND BUS PRODUCTION				
Chevrolet	509	5,016	228,132	285,584
G. M. C.	133	1,084	46,711	79,724
Diamond T	56	37	1,273	2,081
Divco	60	48	1,707	2,938
Dodge and Fargo	1,639	1,242	47,218	52,256
Ford	7,938	6,099	240,621	258,955
F. W. D.	23	11	627	698
International	2,893	2,230	101,014	92,785
Mack	227	190	7,309	11,279
Studebaker	251	127	4,892	9,959
White	310	274	11,915	12,235
Willys	3,194	2,479	81,152	96,543
Other Trucks	80	80	2,880	3,423
Total—Trucks	17,313	18,917	775,451	908,458
Buses	4	38	2,507	3,004
Total—Motor Vehicles	81,578	102,497	4,280,237	5,625,969

NEW FOREIGN CAR REGISTRATIONS*

JULY

1961		1960	
Volkswagen	15,255	Volkswagen	12,254
Renault	3,940	Renault	5,785
Triumph	1,050	Opel	2,322
Mercedes-Benz	1,007	English Ford	2,195
Volvo	947	Triumph	1,842
Fiat	912	Austin-Healey	1,760
Simca	879	Fiat	1,606
Austin-Healey	867	M. G.	1,270
Metropolitan	865	Mercedes-Benz	1,224
M. G.	851	Simca	1,206
All Others	6,359	All Others	10,922
Total	32,932	Total	42,386

SEVEN MONTHS

1961		1960	
Volkswagen	103,159	Volkswagen	88,294
Renault	23,800	Renault	44,032
Fiat	7,495	Opel	17,819
Mercedes-Benz	6,897	English Ford	17,327
English Ford	6,662	Fiat	13,972
Triumph	6,301	Triumph	10,798
Volvo	6,022	Austin-Healey	10,627
Austin-Healey	5,405	Simca	9,725
Opel	5,311	M. G.	8,715
Metropolitan	5,288	Mercedes-Benz	8,233
All Others	45,669	All Others	79,808
Total	222,009	Total	309,350

TRACTOR SHIPMENTS

WHEEL TYPE

Hp. Ratings	July	Seven Months
9-34 belt hp.	2,228	15,083
35-39 belt hp.	1,938	19,834
40-49 belt hp.	2,100	24,897
50-59 belt hp.	1,107	22,858
60 belt hp. and over	2,230	42,295
Total—Wheel Type	9,603[1]	124,767[2]

TRACKLAYING TYPE

20-59 net engine hp.	559	5,061
60-129 net engine hp.	500	3,771
130 net engine hp. and over	571	4,069
Total—Track Type	1,630[3]	12,901[4]

[1]—Valued at $22,403,000
[2]—Valued at $307,996,000
[3]—Valued at $20,799,000
[4]—Valued at $148,374,000

1961 NEW REGISTRATIONS*

NEW CARS

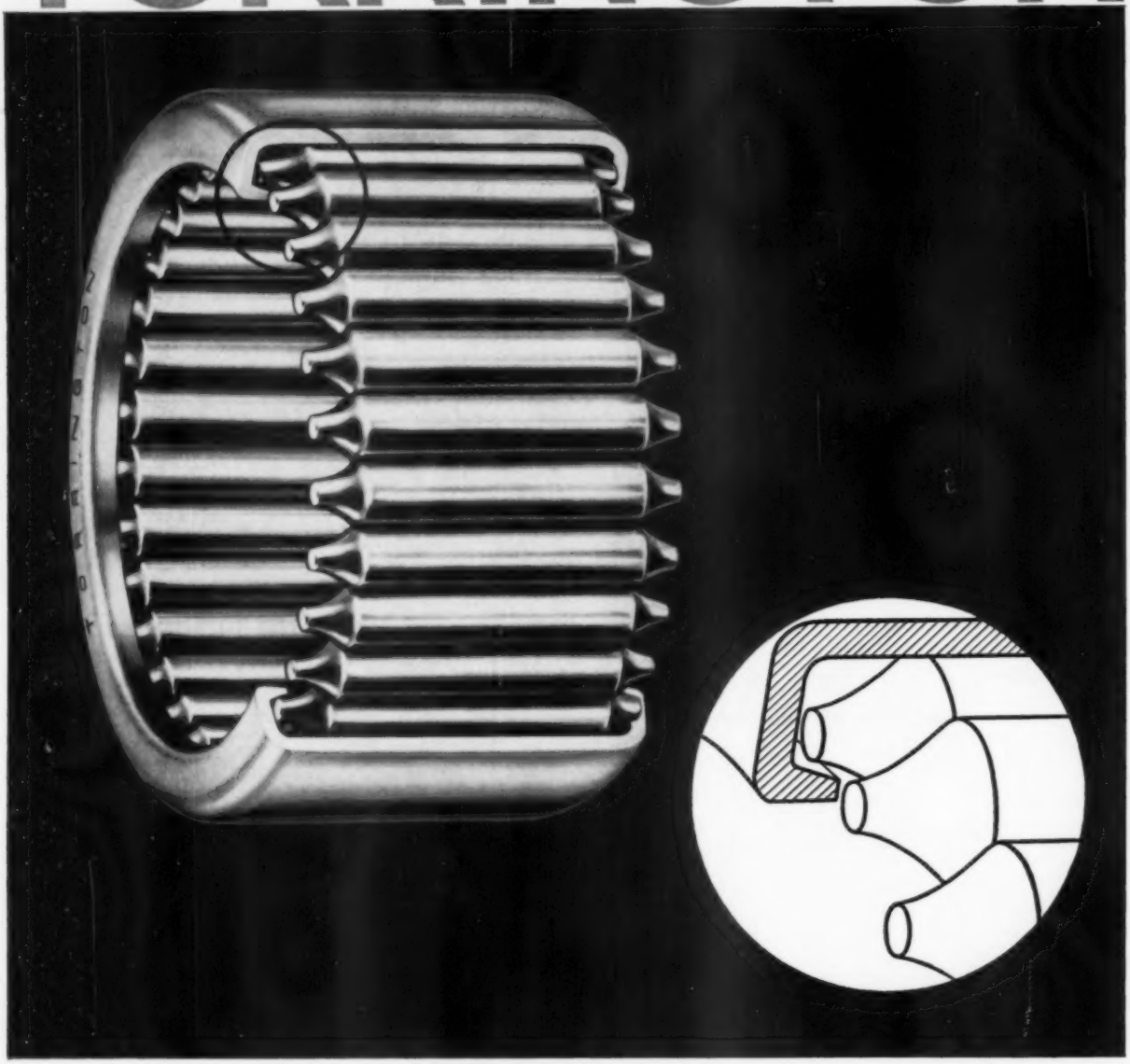
Make	July 1961	June 1961	July 1960	Seven Months 1961	Seven Months 1960
Chevrolet	138,163	165,375	147,288	932,125	1,039,261
Ford	117,920	132,119	108,339	777,852	837,845
Pontiac	29,895	34,697	32,950	212,247	241,861
Rambler	32,920	35,783	39,291	210,231	260,019
Oldsmobile	24,353	29,546	26,214	180,279	205,348
Plymouth	26,344	26,661	38,929	178,947	279,677
Buick	25,220	28,921	19,235	165,187	155,229
Dodge	18,711	20,861	34,998	133,289	229,320
Comet	17,684	20,033	14,245	108,335	69,534
Cadillac	9,931	12,142	10,759	83,335	87,733
Mercury	10,540	11,731	11,050	70,391	93,285
Chrysler	7,639	8,591	6,073	52,966	47,468
Studebaker	4,738	6,010	8,837	42,084	68,315
Lincoln	1,808	2,359	1,283	17,247	13,275
Imperial	750	848	1,133	6,262	9,486
Misc. Domestic	535	518	2,374	4,929	22,798
Foreign	33,895	37,227	43,537	227,578	316,744
Total—All Makes	501,046	573,422	546,535	3,401,284	3,977,186

NEW TRUCKS

Make	July 1961	June 1961	July 1960	Seven Months 1961	Seven Months 1960
Chevrolet	28,391	27,572	26,149	175,047	193,714
Ford	26,369	24,923	23,293	166,541	170,608
International	11,123	10,432	9,646	62,137	67,810
G. M. C.	5,596	5,731	7,565	38,923	48,755
Dodge	3,914	3,461	3,762	23,233	25,845
Volkswagen	2,351	3,006	2,678	15,368	18,494
Willys Truck	1,460	1,501	1,426	10,439	11,027
White	1,242	1,411	1,474	7,916	9,543
Willys Jeep	1,151	1,252	798	6,115	5,799
Mack	800	731	966	5,215	6,982
Studebaker	466	529	629	3,324	3,018
Diamond T	207	168	216	1,110	1,649
Brockway	112	68	90	528	704
All Others	638	684	981	4,810	8,506
Total—All Makes	83,820	81,469	79,674	520,708	572,454

* Compiled from official state records. Data property of R. L. Polk & Co. May not be copied, sold or reprinted without Polk permission.

TORRINGTON



NEVER A SLIP 'TWIXT THIS CUP AND LIP

The Torrington Drawn Cup Needle Bearing is one of the easiest of all bearings to install and maintain. Secret is the turned-in lip construction. This lip positively retains the rollers... keeps them in position as a complete unit during all handling and assembly operations. Install it by simple press fit. No snap rings or shoulders are necessary.

That's not all. The Torrington Drawn Cup Needle Bearing also gives you a higher radial load capacity than any other bearing of comparable size. Precision rollers insure smooth, highly efficient performance, with a minimum of starting and running friction.

This bearing is compact, lightweight, economical. Its unit cost is surprisingly little. For details on how the Torrington Drawn Cup Needle Bearing can help your product, call or write Torrington... pioneer in needle bearings and maker of every basic type of antifriction bearing.

progress through precision **TORRINGTON BEARINGS**

THE TORRINGTON COMPANY Torrington, Connecticut • South Bend 21, Indiana

News of the MACHINERY INDUSTRIES

Cincinnati Milling Machine Co. Adds Electro-Chemical Machining Equipment to Its Folio of Direct-Electrical-Energy Equipment for Handling Difficult-to-Machine Metals

By Charles A. Weinert

Cincinnati Mill Enters Electro-Chemical Field

With the introduction of a line of ECM machines, The Cincinnati Milling Machine Co. has entered the electro-chemical-machining equipment field.

The new ECM equipment supplements the company's Elektrojet electrical-discharge machines and its electrolytic grinding machines for processing difficult-to-machine materials by the direct application of electrical energy.

In the electro-chemical process, electric current is passed through electrolyte between the workpiece and the tool. Otherwise, there is no contact between the tool and the workpiece. Metal removal is solely by electro-chemical decomposition; and the rate of decomposition is proportional to the amount of current (amperage) employed. The tool imparts its shape to the metal being machined.

At the present time, the new Cincinnati machines are being offered in standard Nos. 0 and 1 sizes. The No. 0 machine has an 8-in. vertical quill travel, while the No. 1 machine has a vertical quill travel of 22 in. A solid table or moving table-saddle unit is available for either model.

In addition, a special three-spindle machine is being constructed, and the company says other special multiple-spindle machines can be designed to suit customer specifications.

The No. 1 Cincinnati ECM's vertical head unit contains an anti-friction bearing mounting for the quill, to provide non-stick uniform feed of the electrode into the work. A transparent plastic housing enclosing the work area protects the machine and related equipment from the corrosive effects of the electrolyte, as well as providing visual inspection of the work. The front panel opens for loading and unloading.

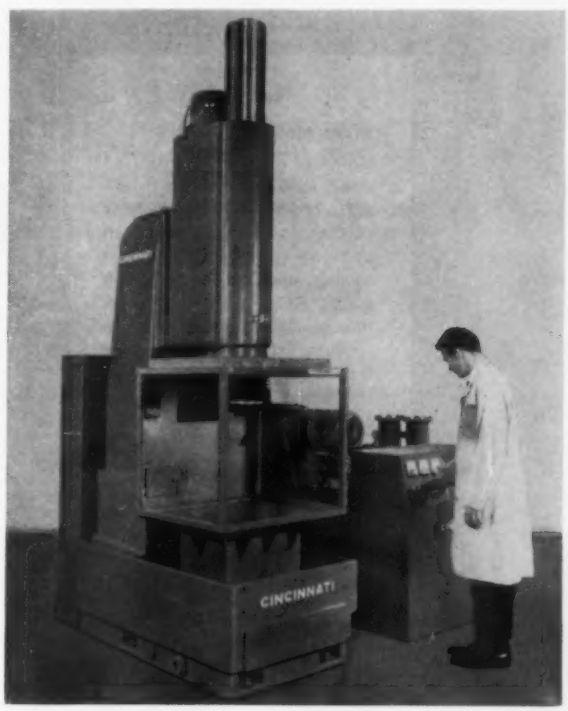
The main supply of electrolyte is contained in a reservoir from which it is pumped at a high rate. A 7.5-hp motor drives the pump, which operates at a maximum of 400 psi and 20 gpm. Flow meters indicate electrolyte movement. All piping is of stainless steel.

Power supplies are available in 1000, 1500, 3000, 5000 and 10,000 amp capacity. These units operate at between 1.5 and 24 volts dc; and are equipped with automatic voltage or current stabilization. They are operated from a control station placed near the machine for operator convenience.

Around the Industry

Dravo Corp.—is building the first self-contained oil-hydraulic Schloemann extrusion press produced in the U. S. The 2200-ton machine will handle a billet up to 32 in. long and 10 in. diam, and is designed for extruding brass, copper, bronze, or aluminum rods, tubes, shapes, solid and hollow sections. About 400,000 lb of steel, including castings weighing up to 20 tons apiece which require boring and facing, will be used.

Baird Machine Co.—Clarence P. Foreman has been appointed chief engineer. Prior to joining Baird in 1948, Mr. Foreman served as assistant chief engineer of Spicer Mfg. Div., Dana Corp., at Pottstown, Pa. ■



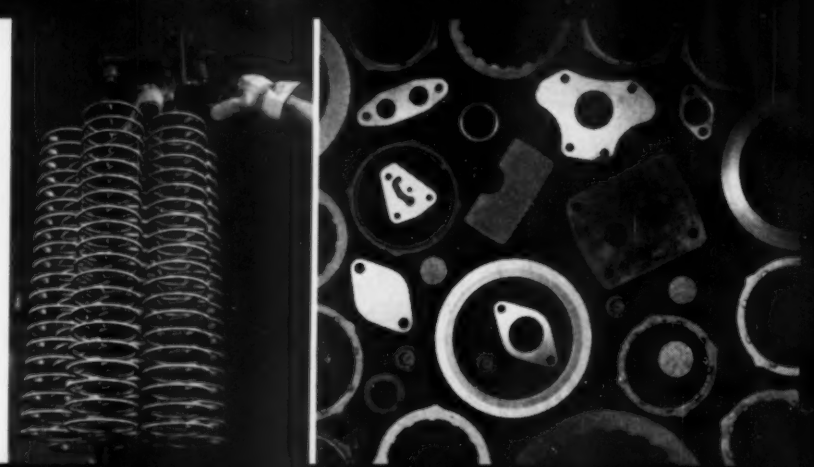
Cincinnati Milling Machine Co. has entered the electro-chemical-machining equipment field with the unveiling of two standard-model machines. The new No. 1 ECM machine pictured has a 22-in. vertical quill travel. Its companion No. 0 size has a vertical quill travel of 8 in. Also being offered are special multiple-spindle designs of ECM machines tailored for specific applications.

FROM AMERICA'S LEADING PRODUCER OF PISTON RINGS...

PERFECT CIRCLE PRECISION CASTINGS

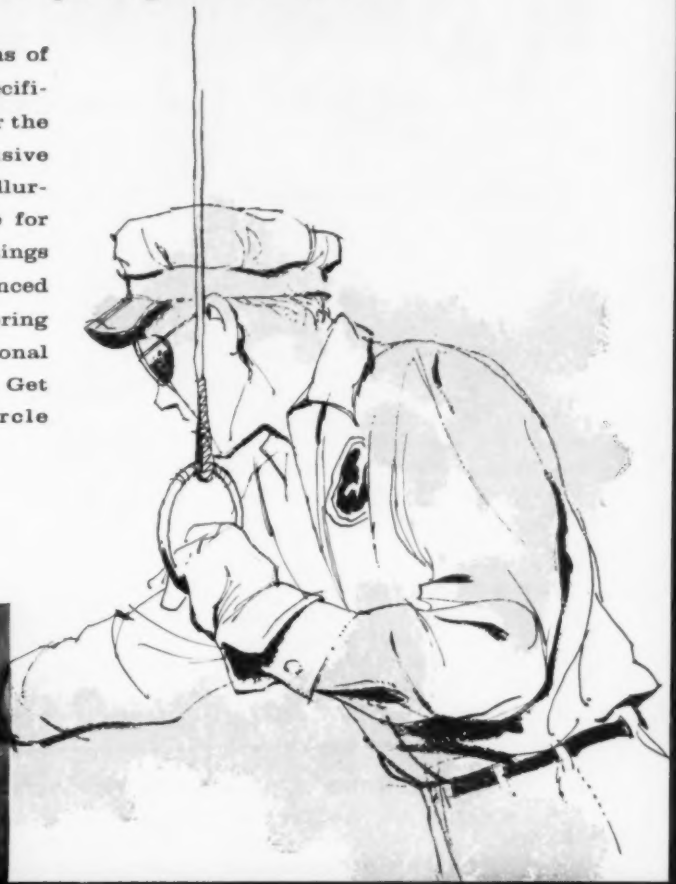
STACK-MOLD CASTING

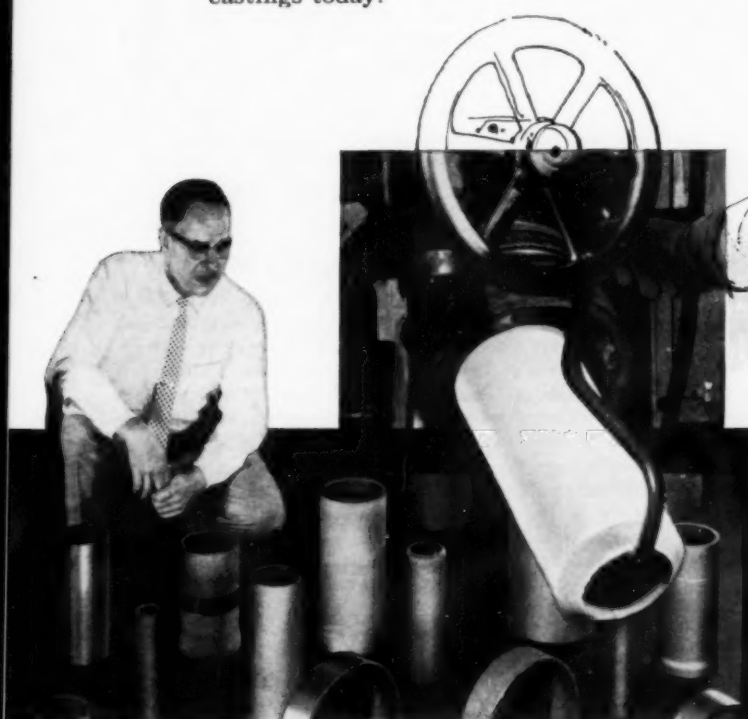
Molds of carefully-controlled green sand are made from the pattern plate, and stacked for pouring. In the example shown at right after shake-out, the castings are 6-up in a stack 20 molds deep. Typical castings produced by this Perfect Circle process include piston rings, thrust plates, valve lifter facings and piston groove inserts.



Mass-produced to the highest quality standards

Every year, Perfect Circle produces millions of piston rings—all made to the exacting specifications that have set precision standards for the industry. Now, as the result of extensive expansion, the modern facilities and metallurgical skills of Perfect Circle are available for volume production of superior gray-iron castings to your specifications. And, through its advanced production techniques, Perfect Circle can bring you the finest metallurgical and dimensional precision at important cost advantages. Get complete information on Perfect Circle castings today!





WHIRLCAST® CYLINDRICAL FORMS

Hot metal is poured into permanent molds, and then spun at high speeds to create machineable cylindrical gray-iron castings of uniform dimension and hardness, with a particularly desirable microstructure. PC Whirlcastings are offered in a wide range of sizes (2″ to 12″ I.D.) and materials, all precision-made for fast, economical machining with minimum stock removal.

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Please send me a copy of the 28-page data and specifications book on Perfect Circle Custom Castings.

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PISTON RINGS • PRECISION CASTINGS
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Circle 124 on Inquiry Card for more data

NEW PRODUCTION and PLANT EQUIPMENT

By C. J. Kelly
ASSISTANT EDITOR

FOR ADDITIONAL INFORMATION, please use reply card at back of issue

Thermo-Plastic Sprayer

EQUIPMENT has been developed to spray-apply hot-melt plastic coatings. Some examples where this spraying equipment could be utilized are in applying protective coatings to entire machines for shipping, or to protect huge machined surfaces from rust or marking.

The new unit is very compact, consisting of a specially designed, gun-type spray head with an adjustable (150-400 deg F) temperature heat jacket, an insulated adjustable temperature supply hose and a portable, ½ hp, self-purging, pumping unit which mounts on a controlled temperature melt tank in much the same manner as an outboard motor.

The plastic material has an approximate melt point of 350 deg F which is maintained from supply tank to target, to spray an ⅛ in. protective coating at the rate of 8 to 10 sq fpm or less, as desired. *Evans-Thompson Mfg. Co.*

Circle 40 on Inquiry Card for more data

Welding of Aluminum

A NEW aluminum electrode with an extruded coating has been designed for all position welding of aluminum. The new electrode features low amperage application and easy slag removal. It provides tensile strength yields up to 28,000 psi.

Called Airco 43, the new electrode is available in two sizes, ⅛ in. dia by 14 in. in length and 5/32 in. dia by 16 in. in length. *Air Reduction Sales Co., a Div. of Air Reduction Co. Inc.*

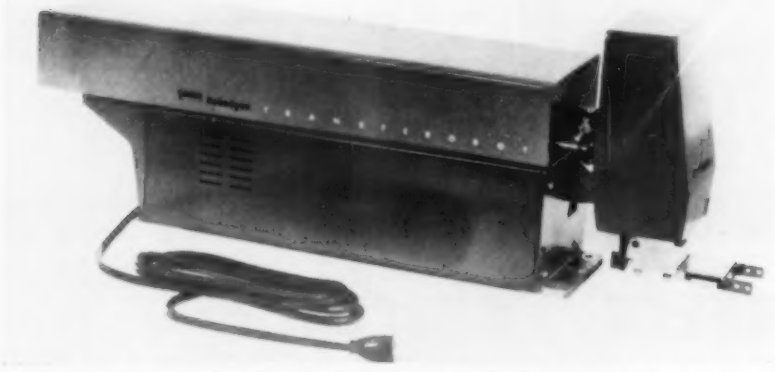
Circle 41 on Inquiry Card for more data

Industrial Robot Operates With Electronic Brain

AN industrial robot has been designed to work on any assembly line under the command of its own electronic brain. According to the manufacturer this unit, called the TransfeRobot 200, is capable of performing numerous tasks in assembly and related operations. In one application of this automated machine the TransfeRobot 200 feeds partially fabricated parts to a trimming press, orders the press to cut off excess material, and ensures that the finished parts are properly discharged from the press. The parts, when finished, are used in an automobile steering assembly.

The new machine can be programmed to do numerous different types of operations by changing the accessories. The unit consists of an arm and an actuator which can be fitted with many types of fingers and jaws, all under control of the self contained brain. *U. S. Industries, Inc.*

Circle 42 on Inquiry Card for more data



New unit performs assembly and similar tasks under command of own electronic brain

Cutting-Grade Carbide

FERRO-TIC-J is the name of a new cutting grade carbide described by the manufacturer as a combination of the hot hardness required in high-speed metal cutting with easy-fabrication features.

In the annealed, as received state, this fully sintered composite of ultra-hard carbide particles dispersed in a high-speed steel matrix can be turned, drilled, milled, tapped or even filed. Once heat-treated up to Rockwell C-70 by conventional methods, however, the tool blank behaves like solid carbide, the manufacturer reports. *Sintercast Div., Chromalloy Corp.*

Circle 43 on Inquiry Card for more data

Flame-Cutting Machine

CUTS in metals ranging in thickness from thin gauge sheet to 2 in. thick are possible with a new 19 lb flame cutting machine. Called the Linde CM-75 "Cadet," this unit is equipped with a clutch allowing instantaneous free-wheeling control. This feature makes it suitable for hand guided contour cutting.

The "Cadet" operates at speeds up to 30 ipm and can be used with acetylene propane or natural gas. *Linde Co., Div. of Union Carbide Corp.*

Circle 44 on Inquiry Card for more data

New Stock Reels

COILS up to 5000 lb can be handled by a new heavy-duty stock reel with an automatic centering spindle. The newly designed unit is available in both plain and motorized models. All models have three support arms with quick adjustment keepers. Arms are the parallel rule type adjustable from the front for a variety of coil inside diameters.

These stock reels are available in three stock width sizes—18, 24 and 36 in. The motorized model spindle speed is 12.8 rpm. *Cooper Weymouth, Inc.*

Circle 45 on Inquiry Card for more data

Air Impact Wrench

A NEW torque control air impact wrench, the J-42T, has a hydraulic amplifier which shuts the tool off when the desired torque is reached. The torque sensing device is an integral part of the driving spindle. It features quick adjustment for a range of 20 to 100 ft lbs.

This adjustment is tamperproof. The unit is rated at ⅜ in. nominal bolt size and is reversible.

An exclusive feature is the exceptionally fast run down and impact speed of the tool while holding close torques.

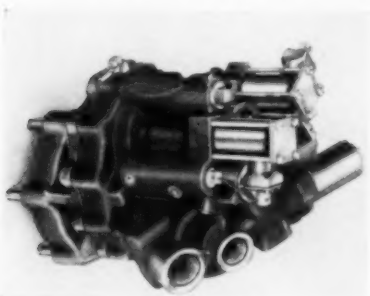
Ideal applications for the J-42T include door hanging and cylinder head bolts in the automotive industry; attaching end plates, flanges, etc. on pressure tanks or vessels. It is designed for innumerable assembly jobs, particularly where specified torque requirements must be met. Optional drives are the ½ in. sq drive, ⅝ in. sq drive or 7/16 in. hexagon external quick change chuck. *Rotor Tool Co.*

Circle 46 on Inquiry Card for more data

Hydraulic Motors

HIGH efficiency and control accuracy are features of a new line of variable displacement hydraulic motors. The new units serve as power sources for AC generators, fuel boost pumps, turbine starters and compressors. This line of fixed angle variable motors provide variable displacement operation by rotation of the valve plate.

Steady state speed regulation, transient error and recovery time of these drives may be matched to any known requirement, the manufacturer states. Typical units are designed for ± 1.0 pct steady state regulation and are fitted with appropriate centrifugal



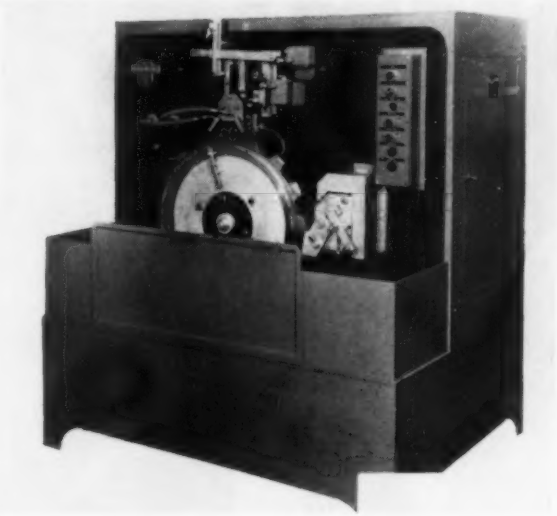
type governors. Steady state accuracy to 0.1 pct can be obtained with the addition of a precision electronic control device.

A typical generator drive unit, the MV-024 series, provides 17.9 hp at a differential pressure of 2750 psi and 8000 rpm. Rated inlet pressure is 3000 psi, maximum displacement is 0.367 in. 3/rev., and dry weight is 11.7 lbs. Package size is approximately 8¾ in. long x 5½ in. wide.

The capability of Vickers hydraulic motors to operate as pumps by rotating the valve plate beyond the cut-off point, while the unit is running, leads to many multi-purpose installations. The combination of turbine engine starting with a generator drive system is a common example. Many other integrated systems are possible. *Vickers, Inc.*

Circle 48 on Inquiry Card for more data

Large Gears Hardened With New Technique



The wearing surfaces of teeth on a 3 ft cast gear sprocket were hardened to RC-55 at rate of one tooth in 25 seconds utilizing a new technique. A specially adapted work coil was coupled with a standard Ther-Monic 50 KW output generator to achieve the hard wearing surface.

Circle 47 on Inquiry Card for more data

THE workpiece used in demonstrating the new technique was a tread drive sprocket for a tractor. The procedure follows:

The tractor tread drive sprocket is loaded on an insulated hub where a quench splash shield is lowered on its hinges. Special low-moisture-absorbing, high-structural-strength insulation protects the sprocket from the grounded hub axle. Toggle clamps retain the work in proper alignment on the hub.

The operator then moves the index stop pawl between a pair of sprockets and lowers the specially hinged water cooled work-coil into place for the hardening operation. The coil operating handle is electrically interlocked with the index pawl and the high-frequency generator to prevent application of heat until the work is properly aligned.

The cycle "start" button is depressed which energizes the work-coil and heats the sprocket teeth. Length of the heating cycle is controlled by an electronic timer which also initiates the quenching operation. The timer shuts off the heat and turns on the water quench-spray blocks.

At the end of this cycle the next sprocket tooth is moved into position in the same manner, and the process is repeated until all sprocket teeth have been hardened. *Induction Heating Corp., Subsidiary of Hathaway Instruments, Inc.*

Corrosion Resistant Alloys

TWO new straight chromium stainless steel alloys have been developed for the automotive industry which combine extremely high corrosion resistance with outstanding fabricating and finishing qualities.

As a result of thorough laboratory and production testing, the major automotive manufacturers have accepted these grades for use in the manufacture of decorative exterior parts such as moldings and hub caps for the 1962 models.

These grades, designated Uniloy 430Mo and Uniloy 435Mo, derive their high corrosion resistance from an addition of molybdenum to the stainless steel chemistry of Type 430.

Uniloy 435Mo, in addition to the molybdenum, contains an element to control roping—an undesirable condition encountered in severe stretch bending and deep drawing operations.

The new materials are now available in production quantities in a full range of strip and wire sizes. *Universal Cyclops Steel Corp.*

Circle 49 on Inquiry Card for more data

GN

Pedrick

SUPERIOR

WHITE
MACHINE WORKS

BURD
GRAY IRON

GE

GN

Nation's largest manufacturer of heavy-duty and specialized engine parts—

NEW GOULD-NATIONAL ENGINE PARTS DIVISION

In creating its new Engine Parts Division, Gould-National combined under one corporate roof the brands, products, services and facilities of these wholly-owned subsidiaries:

Wilkening Manufacturing Co., Philadelphia, manufacturers of Pedrick® piston rings and castings.

White Machine Works, Eau Claire, Wisconsin, manufacturers of Superior-Arrowhead cylinder sleeves, sleeve assemblies, pistons, piston pins, Burd piston rings, valves and valve train parts, foreign car engine parts and filters.

Gillett & Eaton, Lake City, Minnesota, piston and casting specialists of cast iron, aluminum alloy, Vanasil® aluminum alloy pistons and specialized engine parts.

Arrow Head Steel Products, Howell, Michigan, manufacturers of aluminum pistons, connecting rods and other castings.

Now, Gould-National, the nation's largest producer of automotive replacement batteries, is also the nation's largest basic manufacturer of heavy-duty and specialized engine parts. The Division is the largest one stop source for the most complete line of engine parts available from one manufacturer. It is the only engine parts manufacturer with both iron and aluminum casting and machining facilities.

By utilizing the efforts of one combined sales force, the customer will benefit from greater sales-service efficiency, more concentrated field coverage.

Product improvement will result from the formation of a special team in the Gould-National Engineering and Research staff. It is the Gould-National way of assuring continuing top quality and improved product performance.

New engineering developments, manufacturing and production techniques from all areas within the Division will benefit all customers, no matter what the product may be.

This is the Gould-National Engine Parts Division—the nation's newest parts manufacturing group with over two centuries of combined experience.

Need heavy-duty engine parts? Automotive engine parts? Foreign car engine parts? Parts for such specialized applications as air and refrigeration compressors? Need complete and modern facilities for aluminum and iron castings? If your specifications call for the best of these, if you need them fast and need them right . . . turn to . . .

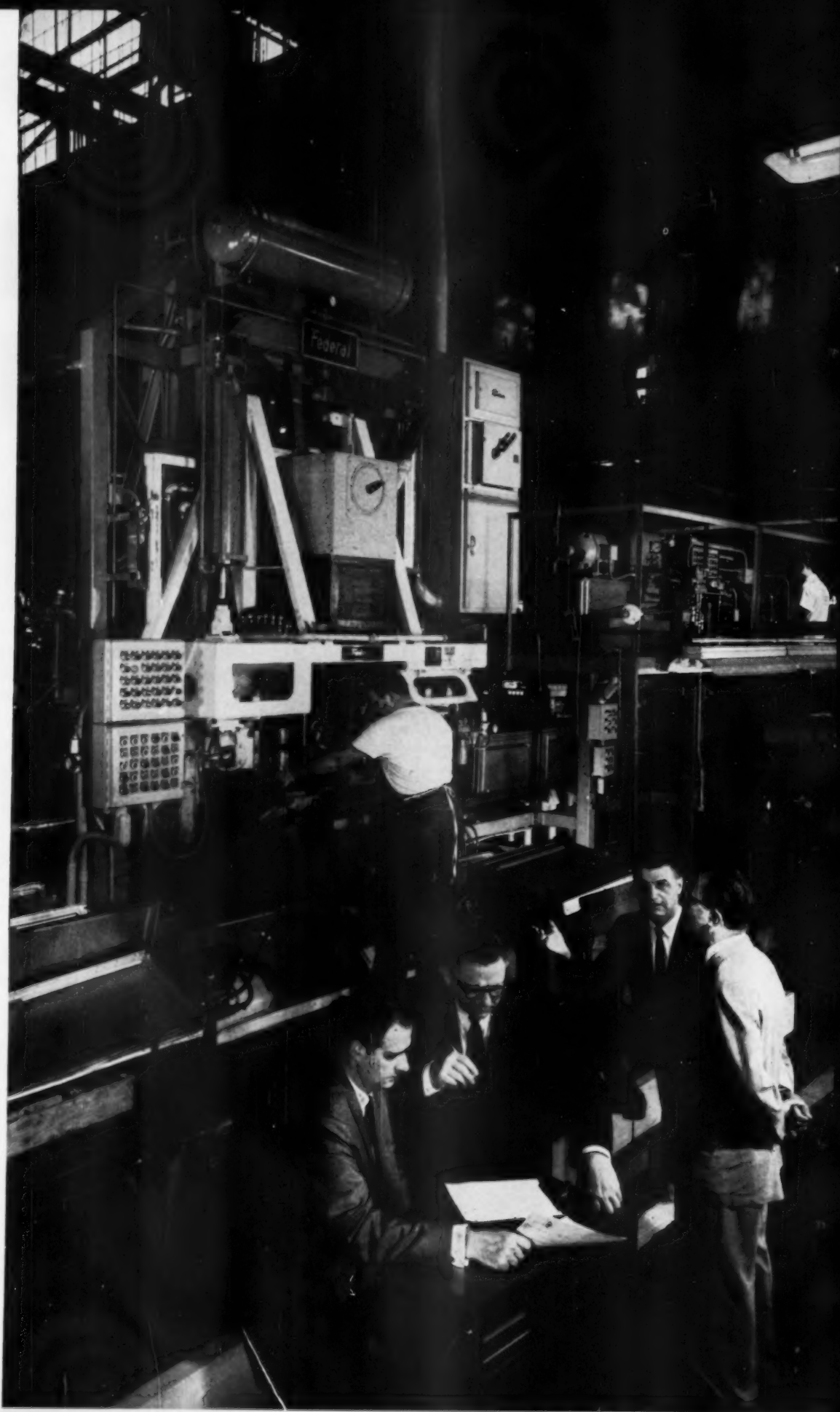
Superior-Arrowhead and Burd are trademarks of Gould-National Batteries, Inc.

GN

ENGINE PARTS DIVISION
GOULD-NATIONAL BATTERIES, INC.
St. Paul 1, Minnesota

Circle 125 on Inquiry Card for more data

Circle 126 on Inquiry Card for more data ⟶

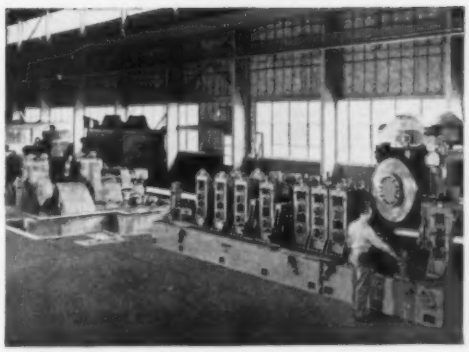


Federal Welding Line at Whirlpool's Evansville, Indiana, refrigerator plant automatically forms and welds together complete food liner shells at a rate of 200 per hour. Here, F. A. Bodenheim, Jr., manager of welder sales for McKay's Federal-Warco Division, goes over latest production charts with H. J. Muehlbauer, director of manufacturing engineering for Whirlpool, as Robert Russell, sales representative for Federal-Warco, discusses operations with Gene Rommel, general superintendent of tooling for Whirlpool.

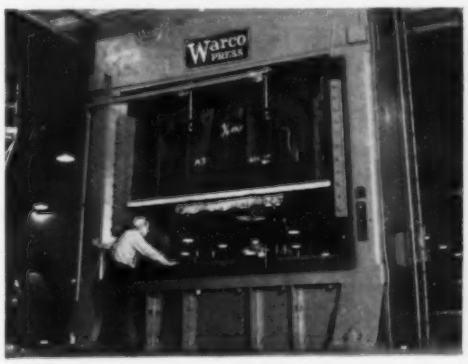
Photo by ARNOLD NEWMAN

A completely integrated plant . . . a single source of supply . . . one area of responsibility! A new idea? Not really, but an idea that's not easy to bring to reality. McKay Machine has done it for metal fabricators, designing and building equipment to volume produce parts or entire units from raw steel to finished product. ***This is McKay Machine*** We know steel handling . . . we've been designing uncoilers and coil-handling equipment for 30 years. McKay Machine knows welding because the highly respected names of Federal Welder and Berkeley-Davis are now a part of our company. We know processing and forming . . . McKay levelers, tube mills, and cold roll forming machines have been specified by leading industrial firms for more than two decades. And McKay Machine knows stamping, as the Warco Press name testifies. McKay builds the industry's most popular shearing and slitting equipment. Only McKay Machine designs and builds all the components for a truly integrated production line. If you are one of the hundreds of manufacturers who must shave production and handling costs to successfully compete, McKay Machine should interest you. If we do, let us know and we'll meet with you at your convenience. *The McKay Machine Company, Youngstown 1, Ohio.*

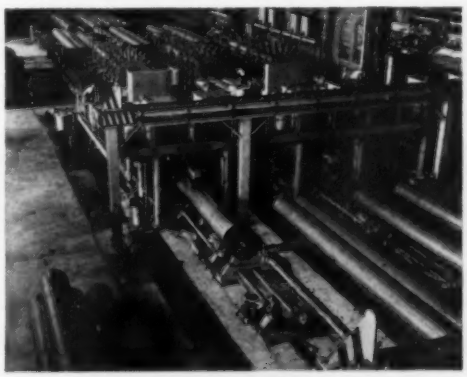
McKAY MACHINE



McKay Tube Mills and roll forming machines are considered among the best engineered in the world.



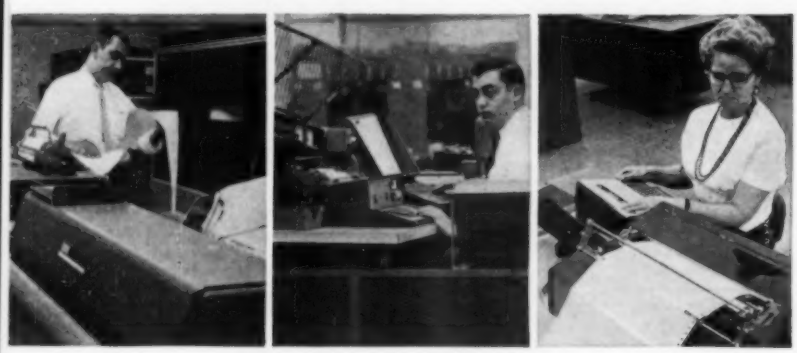
Warco Presses can be found in the leading automotive, appliance and aircraft plants . . . wherever stamping is a major operation.



Berkeley-Davis Fusion Welding Lines, such as the huge installation above, are used by an ever-increasing number of leading steel fabricators.

Inventory Management Simulator program at...

Clark Equipment... improves customer



■ **High-capacity memory.** Two IBM 305 Data Processing Systems with RAMAC keep track of 75,000 replacement and repair parts in Clark's Chicago parts warehouse. ■ **The computer has the facts.** As soon as shipments arrive at the warehouse, an operator, using this remote inquiry station near the loading platform, finds out from the computers where various items go. ■ **Customer service first.** Using this remote inquiry station in the sales department, the operator gets information from the computer while the customer is on the phone.

Clark Equipment Company has prepared a computer program called an Inventory Management Simulator. The program allows Clark management to study the possible effects of decisions on future customer service and future warehouse profitability. When management gets the computer's report, it is in a position to make new rules for the operation of its parts warehouse.

Here's what's happened since Clark put the new program into operation:...improved customer service...practically eliminated back-order problem . . . reduced the putaway time for incoming material by more than 50 per cent . . . reduced emergency order shipping time by 50 per cent . . . enabled a physical inventory to be taken without any interruption of service to customers.

service...with less inventory

Availability highest ever. Inventory management is a complex job at Clark. Its Chicago warehouse is one of the busiest and largest in the country. Before the Simulator program was developed, the warehouse carried an inventory of 85,000 individual replacement and repair parts. Use of the program helped transfer the investment in inventory to those parts most frequently called for, giving high availability with less investment.

Management Operating System.* Clark installed two IBM 305 Data Processing Systems with RAMAC.® These computers store, update, and offer on an instant's notice information on almost every aspect of the warehouse operation including complete information on every one of the 75,000 items maintained in stock.

Now, Clark is assured of maintaining just the right level of stock for each item. The procurement formulas, developed from the Inventory Management Simulator, even recommend how large a purchase order should be placed for each item and where it should be placed.

If you have an inventory problem, why not consider a simulation program? You don't have to have your own computer. We can supply you with an Inventory Management Simulator...you can rent time on a computer. Result...improve the profitability of your warehouse operation.

**A Management Operating System uses IBM computers to make routine business decisions and take action automatically ...flags problems that need management's special attention... frees management to concentrate on the big problems and on long range planning. As a result, it gives tighter control of all business operations...and helps cut costs.*

IBM®
DATA PROCESSING

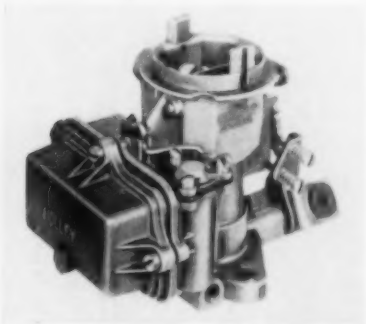
NEW PRODUCTS AUTOMOTIVE-AVIATION

FOR ADDITIONAL INFORMATION, please use reply card at back of issue

By C. J. Kelly
ASSISTANT EDITOR

New Carburetor

Several *Chrysler Corporation* cars will feature a new carburetor in their 1962 models. The new component will be original equipment on the 1962 Valiant, Lancer, Plymouth and Dodge Dart.



Designated the Holley model 1920, the new carburetor has a one piece aluminum die-cast body with a removable zinc fuel bowl. It is a single bore downdraft with a divorced choke.

Simplicity in servicing is regarded as one of the features of the model 1920. Four gaskets, a rubber grommet and five service assemblies are all the parts necessary for a complete overhaul. Gasket and repair kits for aftermarket sale will be made available shortly after the beginning of the model year. *Holley Carburetor Co.*

Circle 70 on Inquiry Card for more data

New Spring Plungers

Spring plungers, used in positioning parts for jigs and fixtures, have been designed to withstand continuous flexing without crystallization. The plungers feature a specially compounded and treated spring to eliminate crystallization. When compressed, the spring allows the plunger to recede entirely into the threaded body. A set screw backing up the spring is pre-set and locked-in with special sealant for uniform, constant pressure.

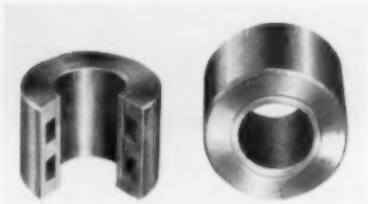
Plunger tips, made of hardened steel, will not "mushroom," even under constant use. They can be ground to meet specific needs without being weakened.

Jergens new spring plungers are available in a silver-nose (cadmium-plated) model designed for milder end pressures, as well as the regular heavy-duty type. Each model comes in 10 sizes. *Jergens Tool Specialty Co.*

Circle 71 on Inquiry Card for more data

Sleeve Bearings

Neverlube is the designation given a new line of sleeve bearings. The design characteristics of this new product is a machined steel outer sleeve or cartridge in which an oil reservoir, in the form of internal grooves, has been provided. The oil reservoir is filled with a special oil during assembly of a sintered bronze bushing and



CUTAWAY VIEW

capillary action of the oil in the reservoir thru the sintered bushings, provides a continuous oil film between the assembled bearing bore and shaft for a substantial period of operation.

Application for these bearings are primarily those inaccessible to regular lubrication, where periodic lubrication is uncertain, or where the quieter operation of a sleeve type bearing is desirable. *Carter Mfg. Co.*

Circle 72 on Inquiry Card for more data

Industrial Disc Brake

A new low-cost disc brake has been designed for application on a wide range of industrial machinery and small vehicles. The new brake assembly units will be available with 7, 12, and 18 in. discs to give a range of torque capacity up to 9000 lb in. and kinetic energy capacity up to 1 million ft lbs.

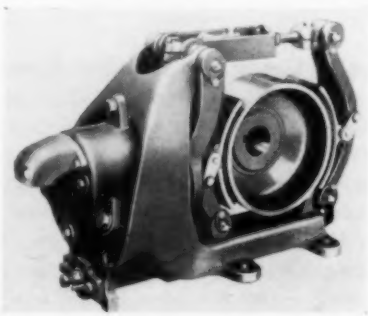
The brake can be applied by hydraulic or pneumatic action. A universal mounting configuration allows mounting of the brake housing on almost any existing support. Equal torque forward or backward and automatic adjustment to compensate for lining wear also are engineered into the brake. *Goodyear Tire and Rubber Co.*

Circle 73 on Inquiry Card for more data

8-in Magnetic Brake

A newly developed 8 in. magnetic brake conforms to AISE-NEMA standards for 600 series mill motors. Known as the Clarke Bulletin 106 B, this shoe type brake utilizes the "nutcracker" principle of operation. This design assures that equal pressure is applied against the wheel by both shoes, which are self-aligning and symmetrical.

The magnetic coil can be changed "on the job" without dismantling the brake. This is a useful feature on crane applications and other installations where maintenance is difficult. The coils are epoxy encapsulated to



seal out moisture and to protect the coil.

A single adjustment compensates for lining wear and magnetic gap. A built-in adjustment indicator shows when adjustment is needed. Also, an indicator is provided for torque setting. *The Clark Controller Co.*

Circle 74 on Inquiry Card for more data

← Circle 127 on Inquiry Card for more data

Circle 128 on Inquiry Card for more data →

Stop looking for spring wire in large coils...it's here (*courtesy of Roebling*)

This is really an enormous availability—3000 pounds of high carbon spring wire in a single, nonstop coil. You know what this means. Uninterrupted productivity. You make more of your products faster and, as with *any* length of Roebling spring wire, you make them better.

Another happy availability (also in large coils) is new Roebling Springkote* Wire. Springkote runs through feed rolls without slippage, stress relieves more uniformly and takes finishes better—yet costs no more than lime-coated wire.

For information on this ready abundance and on new Roebling Springkote, write Roebling's Wire and Cold Rolled Steel Products Division, Trenton 2, N. J.

*Reg. T. M.

ROEBLING

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John A. Roebling's Sons Division
The Colorado Fuel and Iron Corporation

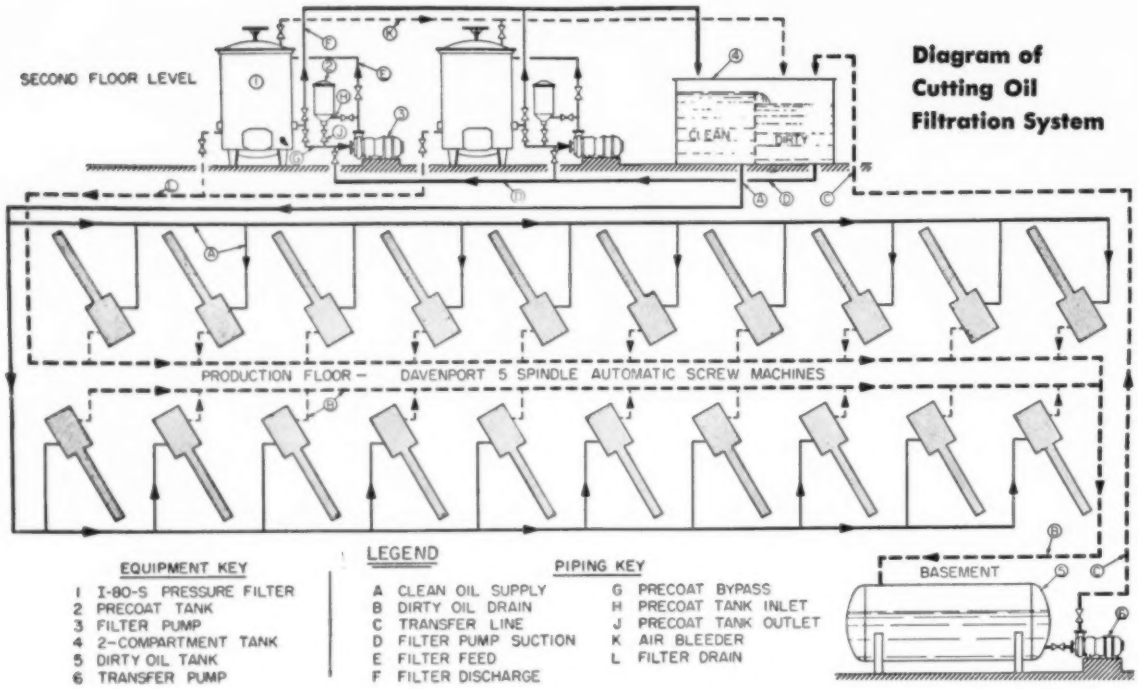


Diagram of Cutting Oil Filtration System

How Maximation Eliminates Hidden Machine Costs

. . . at the Teale Machine Company

By: H. L. Gaudriot, President
Teale Machine Co.

More than any other factor, high costs have been responsible for introducing a new efficiency concept in plants producing screw machine products. This reduction of operating expense with an increase in profits is termed MAXIMATION – getting maximum production from machine tools by eliminating hidden costs.

Responsibility Placed On Oil

At our plant in Rochester, N. Y., dirty cutting oil was preventing the plant's 24 Davenport 5 spindle automatic screw machines from functioning at their designed efficiency. Metal chips, solid abrasives, grit, dirt and fine particles in the oil stream were responsible for numerous extra costs. These included frequent down time for tool grinding and sump tank cleaning, shorter useful life of oil, poor product finish, many rejects and excessive maintenance. In addition, oil spillage created a waste and housekeeping problem. Handling of oil barrels was expensive, hazardous and untidy. To remedy the situation, the Teale Co. installed a complete Hoffman Central Pressure Filter System for reconditioning all cutting oil before it reached the automatic machines.

How Filters Operate

The central pressure filtration system includes 2 Hoffman Model I-80 S pressure filters with pre-coat tanks, chip wringers and motor driven pumps. Gravity flow through header pipes and lead-off lines delivers clean oil to each screw machine. As dirty oil enters the filter under pressure, it is filtered through a metal screen and thinly precoated with inexpensive filter-aid powder which is easily applied and easily removed. Valuable additives remain unchanged. After passing through the screen, the clean filtered oil flows down a center tube into the outlet manifold. From this point, the clear filtered oil is recirculated to the machines.

Benefits And Advantages

After one year of operation with the Hoffman system, maximation was achieved with these unprecedented production and operation savings:

- Higher speeds, faster feeds, improved finishes, a better part at less cost.
- Fewer rejects – higher production rate.
- Longer tool life with clean oil free of chips and abrasive dirt particles.
- No loss of oil during chip removal.
- Greatly reduced down time. Cleaner floors. Oil waste reduced to a minimum.
- Maintenance of individual motor pumps completely eliminated.
- Actual records showed the yearly oil loss reduced to .1665 gallons per production hour or an approximate saving of 21.7%.

Maximation Pays For Itself

The Hoffman Central System has made it possible to effect actual economies which have enabled us to pay for the installation in a satisfactory period of time. Reduced maintenance, longer tool life, improved product finish and other benefits have saved us thousands of dollars in turning out a million parts a day. Filtration by Hoffman is the ideal way to maintain clean cutting oil.

Comparable maximation results have been obtained at the Utica Drop Forge Div. of the Kelsey-Hayes Co., the Air Reduction Co., Kearney & Trecker Corp., Taylor Instrument Co., etc. etc. To check on the applications of individual tool and complete central pressure filter systems for cutting oils, water base coolants, grinding oils, honing and lapping oils, petroleum solvents, industrial waters and other fluids in your plant, send for free Bulletin FB100 and case histories.

Write U. S. Hoffman Machinery Corp., Dept. T-1, Industrial Filtration Division, Thompson Road Plant #1, Syracuse 6, New York.

METALS

With the Domestic Steel Industry Operating Well Below Its Rated Capacity, No Across-the-Board Price Rise Is Expected.

By William F. Boericke

Steel Price Rise Uncertain

Whether steel prices will be raised in October following the wage hike remains very much of an open question. There is no doubt that the political pressure from Washington warning against a price increase has put the producers in a very uncomfortable position. However, well justified a higher price may be, it would be attended with much popular resentment from those who have little or no conception of the problems facing the steel industry. The contention of steel executives that a price increase is required to continue extensive modernization of the plants to keep them competitive, that steel prices have not been raised since June, 1958, and that cumulative cost increases since that time have amounted to about $8 a ton on finished steel, has made no great impression on the man in the street. The reaction of the steel companies to the President's letter urging no upward revision in prices following the October wage increase is understandingly unfavorable. Executives have said in essence that price hikes may be required to offset higher costs. Bethlehem's chairman declared that his company felt free to raise prices, if necessary, because of a squeeze on profit margins. As this company has failed to earn its dividend in the first half of this year, it speaks with conviction.

Deterring Factors Against Immediate Increase

But it might appear that the Administration was over-apprehensive of a price increase across-the-board. Certainly, there is little indication that such a step is seriously considered at this time. Economic factors in the steel industry, of which company executives are only too well aware, are not favorable. Competition for business is extremely keen. Foreign steel offers a formidable threat for certain products. The domestic industry still is operating much below its rated capacity.

While it appears unlikely that any across-the-board price increase will be attempted, it is possible that some selective price boosts will be initiated, in every instance with market conditions considered in pricing. A selective price increase would come as no surprise to consumers and might pass muster in Washington. But to attempt to raise prices on products that have been subject to price cutting, such as stainless steel and oil country goods, would need considerable courage at this time. Manufacturers of tin plate might be included, among those who are unwilling to advance prices, as they have given no advance notice to their customers as has been the usual trade policy. It also appears that steel prices have slipped further at the warehouse level as mill competition mounts. Galvanized steel was cut as much as 7 per cent last month. Excess steel-making capacity is blamed.

Operating Rate Climbing

This is not to gainsay that the industry has made good headway in regaining its health after the recession that characterized the early months of the year. Orders have increased appreciably even during the normally dull summer months. The operating rate was better than 72 per cent in mid-September, and may hit 80 per cent in the fourth quarter. Incoming orders indicate a broad sustained recovery, although business from the automobile manufacturers is less than the normal pattern. As yet, there appears to be little buying for inventory building and no hedging against a price rise. Steel is going directly into the hands of the consumer.

Copper Figures Improve

Figures released by the Copper Institute for August show improvement in the statistical position. Domestic deliveries rose 8000 tons over July. World production of refined copper was less than deliveries to fabricators and stocks declined in consequence. Mine production was down because of the strikes in Chile and Utah, which ended in early September. About 60,000 tons were lost in world output. The domestic market continues strong with smelters selling on average price basis for October instead of a fixed price. This usually has presaged a higher smelter price. It will take at least two months before pipe lines can be filled and a normal flow of copper from the mines can be resumed.

Aluminum Expects a Better Fourth Quarter

Aluminum executives are optimistic over prospects for the fourth quarter. Business is improving although not at a spectacular rate. Output of primary metal has risen. The six primary producers turned out 166,000 tons in August and shipped 155,000 tons, employing about 79 per cent of installed capacity. Inventories have been reduced to a 47 day supply. Export sales are inching up, although still barely more than half the record rate of 1960. A spokesman for Reynolds Metals has opined that a new boom in aluminum demand could come sooner than expected, and estimated that total shipments in 1961 could approximate 2,400,000 tons, up 4 per cent over 1960. He projected a 20 per cent increase in 1962 to total 2,900,000 tons. ■

The New Studebaker

(*Continued from page 57*)

transmissions reduces noise transfer.

There is a revised intake manifold to provide for better alignment and faster warm-up. A dry silencer type air cleaner with larger filter element (same as for the V-8) almost doubles capacity.

Generator and voltage regulator are new, conforming to circuit changes and wire standardization.

Compression ratio is as follows: standard—8 to 1; optional—8.5 to 1; 9 to 1 is available only on export cars.

The following revisions are made in the 259-cu in. V-8 engine: water pump with new cover, shortened shaft, and slinger eliminated; new air cleaner and silencer mounting together with a revised carburetor tuned to the silencer.

Compression ratio options are revised as follows: standard—8.25 to 1; optional—8.5 to 1, and 7.5 to 1 with heavier gasket. A 9 to 1 ratio is available only for export cars.

Coming to chassis details, it is of interest to list the following changes and improvements.

Rear springs on all models are assembled with inserts only at the leaf tips, instead of the full length inserts used previously. A spring insulator has been installed between the axle pad and spring to reduce road noise.

The gasoline tank has been revised to relocate the filler neck at the center of the tank on all models, except station wagons. The filler pipe is located at the rear center of the car on sedans. A vent pipe has been introduced for the new installation.

The chassis frame is new, having three inches added at the rear to take the new bodies, except on station wagons.

On interior trim items, it is of interest that the front seat has a two-piece frame construction with full back and separate cushions, all cushions employing cone coil springs instead of the formed wire design.

THE STUDEBAKER HAWK for 1962 has been restyled from a sport-coupe to a sport-hardtop, renamed "Gran Turismo." Overall dimensions remain the same.

Body sheet metal has been revised to suit the new styling. The roof level at the rear has been raised incorporates a solid area at the rear of the stamping rear quarter panel to accommodate the insignia and a wide chrome above the molding.

Eye appeal has been freshened by means of a new front grille, elimination of the two small grilles employed last year as well as the air intake opening at the hood. In addition, all fins have disappeared.

Bucket seats continue as standard equipment in the front compartment. The four-speed, floor shift, transmission is optional. ■

Buick Special

(*Continued from page 41*)

series. However, an integral power gear, similar to that on the larger cars, is offered optionally.

The three-speed manual

transmission remains standard; while the Dual Path, air-cooled automatic transmission is available as optional equipment. Constructed mostly of aluminum, it makes a Special 15 lb lighter than when equipped with a manual transmission. The unit has increased durability due to the adoption of a larger sun gear needle bearing.

On the manual transmission the travel from second to high has been reduced.

NEW SHIFT CONTROL

(*Continued from page 43*)

Initial movement of the shift lever releases the clutch quickly by means of a micro-switch on the column actuating a small solenoid valve. This "dumps" the servo pressure into the suction port of the pump. Completion of the shift re-establishes clutch pressure according to the torque of the engine at that moment.

Both the release and initial engagement movements of the servo are made rapidly through the generous oil ports between the pump and servo, but the final engaging motion is "checked" by an orifice in a free floating disk after the first 1¼ cu in. of oil has entered the servo. This gives the engine time to accelerate up to or slightly above the transmission input speed after each shift to avoid the feel of a torque reversal. It also permits extra or reserve pressure to be employed without the feel of harshness or abruptness in the engagement.

The servo, mentioned above, may be seen in the photographic illustration directly adjacent to the flywheel housing, and in section in the diagram. It is attached to the clutch yoke which is seen in the photograph where it emerges from the opening in the side of the flywheel housing. The retractor spring, too, is clearly shown in both illustrations.

It is obvious that for the buyer of a low priced car, E-Stick offers an approach to automatic drive without the cost penalty, although this arrangement retains the economy of a manual transmission with or without overdrive. ■

1962 Pontiac

(*Continued from page 46*)

haust-heated area and heat transfer fins to provide faster warm-up and improved economy. The manifolds are streamlined for better breathing.

The two-barrel carburetor on the basic engine used with HydraMatic improves fuel economy and provides smoother operation during warm-up. All four-barrel carburetors have been redesigned for improved fuel flow control and smoother, more economical road operation.

Engine vibration has been further isolated by new mounts as well as a revised throttle linkage, employing a cross shaft.

Pontiac pioneered the adoption of a one-piece aluminum hub and drum, used in conjunction with an aluminum wheel, and continues this optional feature for 1962.

Chassis improvements, too, have been effected. One of these features is the adoption of tapered roller bearings at the front wheels, used up to now only in Pontiac heavy duty chassis applications. New rubber bushings in the control arm of both front and rear suspensions provide increased cushioning and isolation from shock and noise. Shock absorbers have been recalibrated for a softer ride. The steering linkage has been revised to improve maneuverability, resulting in a decrease of three feet or more in turning diameter.

Important gains have been made in the performance of the Hydra-Matic drive. Improvements in design detail, coupled with better gear cutting techniques are aimed at reducing noise level. The transmission oil pump has been redesigned, reducing seal damage from overheating by lowering oil temperature.

The power brake system incorporates a new power cylinder with an integral vacuum reserve chamber and check valve. The plumbing is simplified by retaining only one vacuum hose. In addition, there is a drain passage with a filtered vent, plus relocation of the air inlet filter to the passenger compartment to prevent entry of road splash.

Other accessory items include: provision for safety belts as standard equipment; a radio with fully transistorized chassis; a new air-conditioning unit with six-cylinder compressor which has larger capacity within a smaller package and is quieter in operation.

The chassis frame has been made still stronger and more rigid. New front suspension ball joints add to durability and easier handling. Generators and voltage regulators have been improved to handle higher electrical loads. Distributors have a built-in reservoir with wick oiling system for life-time lubrication. ■

Mercury Montery

(*Continued from page 54*)

trifugal and vacuum control.

Both the Merc-O-Matic and Multi-Drive Merc-O-Matic transmissions have vacuum throttle control for shifting, eliminating much of the linkage and making periodic adjustment unnecessary.

Manual shift transmission refinements make shifting easier and safer. One feature is an arrangement that prevents engagement of low or reverse until the clutch is fully disengaged. Changes in synchronizers and an increase in the mechanical advantage of the linkage reduces gear shift effort.

Mufflers for single exhaust systems are of aluminized steel, double-wrapped, with a laminated exhaust pipe to reduce noise level. Dual exhaust is standard with 390-cu in. engines and on convertibles, optional on the other V-8's.

Rust-proofing has been further improved through the use of galvanized steel rocker panels, plus the spraying of lower body areas with Zinc-rich primer. In addition, asphalt-base mastic is sprayed on underbody areas, along the fender, wheel wells, and other areas subject to wheel splash.

Body insulation has been given extensive treatment. A one-inch blanket of fiberglass and a finish board are applied to the dash. Some 90 sq ft of sprayed-on sound deadener and 170-sq ft of blanket insulation also are employed. Roof panels are insulated by means of a felt pad between the roof bow and panel, plus a layer of fiberglass. ■

USS Higher strength steels make more sense for this rugged, lightweight trailer

(It carries 1100 pounds more)

Here is a high-capacity dump body trailer that gives you a substantial dead-weight reduction for only a few cents per pound of payload increase!

This trailer, which went into service in January, 1961, hauling both hot and cold slag, is proof that each pound of payload increase you buy can cost as little as 35¢ per pound.

To prove our point, this 27-cubic-yard trailer was created by the TEC Division of the Heil Company, Cleveland, Ohio, in conjunction with the Applied Research Laboratory of United States Steel. Using the USS Family of Steels—carbon steel, USS COR-TEN High-Strength Low-Alloy Steel (50,000 psi minimum yield point) and USS "T-1" Constructional Alloy Steel (100,000 psi minimum yield strength)—compared to a similar capacity carbon steel trailer, we were able to reduce the weight of this one by 1100 pounds—at a cost of only *35¢ for each one of the 1100 pounds.*

This was done by using 14-gage USS COR-TEN Steel for the trailer body sides, 12-gage in the floor, and USS "T-1" Steel in the high strength draft arms.

As a bonus, both USS COR-TEN and "T-1" Steels give you four to six times the atmospheric corrosion resistance of carbon steel. You also get high resistance to abrasion and impact. USS COR-TEN holds paints considerably longer than carbon steel.

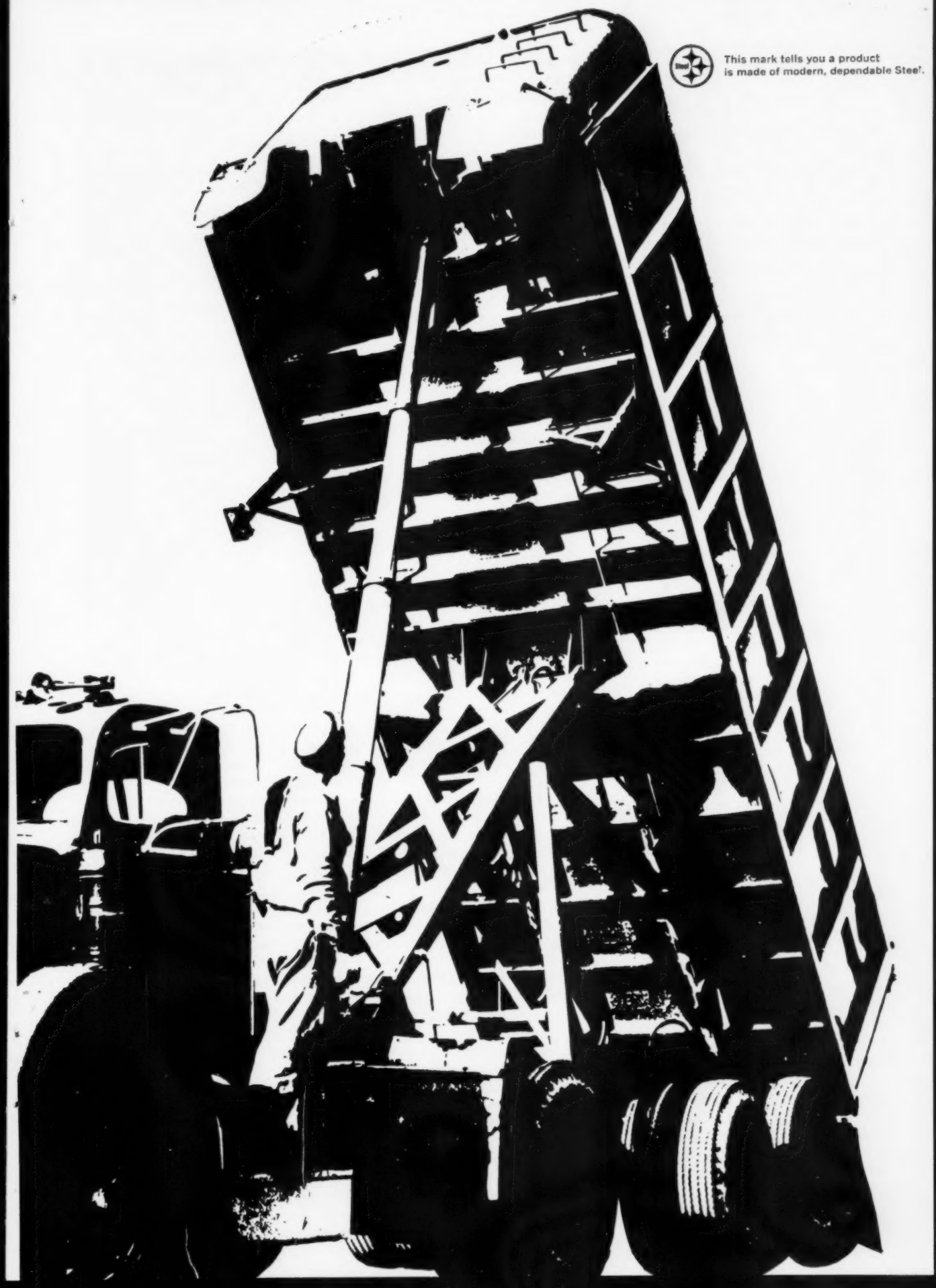
In other words, pound for pound, higher strength steels have yet to be equalled by any other material when you consider strength, endurance and cost.

The tremendous success of this model has led to the design of a similar steel trailer that will lop off still another 400 pounds of dead weight (9100 lbs. tare). For more information about USS "T-1" Constructional Alloy or our various grades of high strength steels, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania. USS, COR-TEN and "T-1" are registered trademarks.

United States Steel Corporation • Columbia-Geneva Steel Division • National Tube Division • Tennessee Coal and Iron Division • United States Steel Supply Division • United States Steel Export Company

USS **United States Steel**

This new frameless steel trailer built with USS COR-TEN and "T-1" Steels easily withstood a punishing seven-month service test hauling 23,000 tons of hot and cold slag and is ready for several more years of gruelling work. Operator: Hawkins Contracting Company, Pittsburgh, Pennsylvania.



This mark tells you a product is made of modern, dependable Steel.

1962 Galaxie

(*Continued from page 53*)

velopment for some 10 years, this exclusive device is comprised of a special die-cast aluminum rocker arm; an eccentric—made of powdered iron; an eccentric spring and plunger; and an adjusting screw. The eccentric has a specific cam shape, making it capable of compensating for changes in valve trim length resulting from wear, or growth due to temperature changes, or changes stemming from high accelerations of the mechanism. To accomplish this, the eccentric is properly adjusted to a visual zero position and is wedged against the valve stem through the action of the spring and side-mounted plunger.

Other engine changes include: rust preventive coating on valves; Gerotor oil pump on the Six; improved engine mount insulators on the Six; laminated muffler intake pipes to reduce exhaust noise.

Similarly, improvements have been made in transmissions as follows: standard three-speed transmission has a transmission clutch interlock to prevent accidental shifting into low or reverse; mechanical throttle valve control on Fordomatic has been replaced by a vacuum throttle control valve to provide smoother response as well as to eliminate periodic linkage adjustments; on manual transmissions heavier shifting rods give a more positive engagement feel. In addition, introduction of a plastic gear shift lever vibration damper eliminates vibration transfer at the lever.

Some of the major improvements in the chassis may be described briefly as follows. All single mufflers are aluminized; dual mufflers combine stainless steel and aluminized steel. Brake adjustment screws are electro-film coated to prevent sticking in the self-adjusting brake mechanism.

Front suspension lower ball joints now are spring loaded for better retention. Accelerator controls are redesigned to eliminate vibration at the pedal. Rear axle pinions are shot-peened for longer life and quiet operation.

Although the basic body shell remains about the same, many items of sheet metal are entirely new. Among these are: the roof panel and roof rails; upper back panel; quarter panels; deck lid; lower back panel; rear floor area and rear cross member. When these changes are totaled they constitute much of the complete body structure.

From the standpoint of noise reduction and passenger comfort the Galaxie has been treated to some noteworthy improvements. Here are some of the items of insulation developed for 1962 cars: inner wheel housing, including the fender apron, is sprayed with mastic deadener; the dash has a one-inch sheet of fiberglass with a covering of three-ply asphalt-impregnated finish board; cowl top and sides have a half-inch blanket of fiberglass or amberlite cemented to the inside areas.

Floor pan treatment at the front consists of a two-ply asphalt impregnated waffle felt deadener cemented to the metal with a covering of ½-in. thick amberlite plus a thick layer of jute. The rear seat area has two-ply waffle felt cemented to the steel. The floor covering has a thick layer of jute on the underside. ■

Buick V-6 Engine

(*Continued from page 40*)

again is demonstrated when driving the car, as we did. When the normal driver gets behind the wheel he cannot tell the difference between this engine and a V-8.

Returning to the matter of advance planning, note that the V-6 was launched most economically through fruition of the program of interchangeability. It has simplified the manufacturing problem and limited expenditures for new tooling.

Here again, advance planning is what made it imperative to settle on the 90-deg configuration. The fact is that all of the machinery and transfer lines in the Buick V-8 engine plant are based on 90-deg banks. To succeed, the new program had to comform to this pattern in order to use available machinery. This is an excellent example of how engineering planning dovetails with requirements of the manufacturing department.

To sum it all, the Buick V-6 has been a project well done any way you look at it. ■

Rambler American Models

(*Continued from page 56*)

offered as optional equipment, will be standard on all 1962 American models.

Lubrication and oil change recommendations will be increased on 1962 Rambler American models. Front suspension and steering linkage lubrication will be extended from 1000 to 2000 miles. Normal drain period for engine oil is changed from 2000 to 4000 mile intervals. Drain and refill mileage for automatic transmission fluid is changed to every 25,000 miles rather than 15,000 miles.

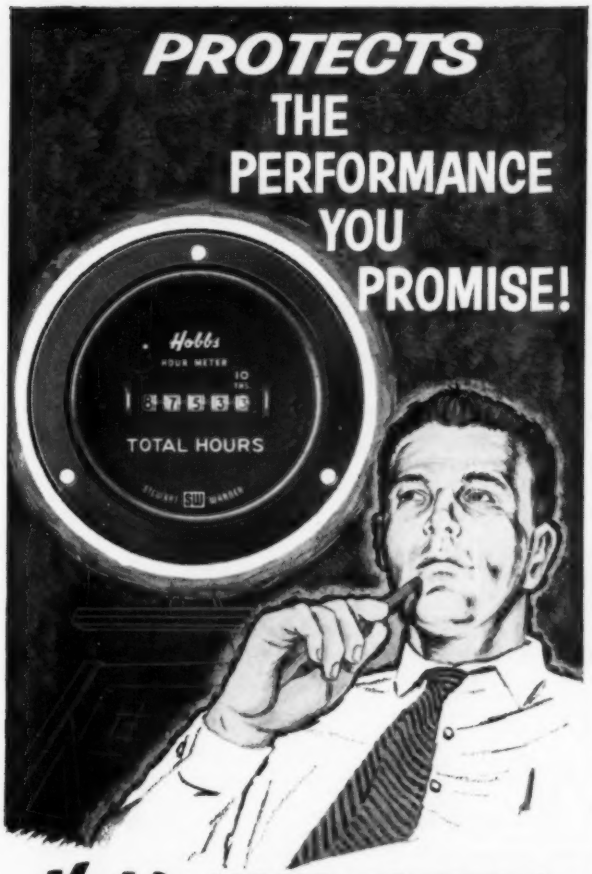
As a new standard feature on all American models, front seat belt attaching plates, plus rear set belt locating indentations, are provided at the factory. Seat belts are offered as a factory-installed or dealer-installed option.

The overall steering ratio has been increased to reduce steering effort. Improved power steering, offered as an extra cost option, also is available on all models.

Rear springs and shock absorbers are revised for improved riding qualities. Load-Leveler rear shocks are a new factory option.

Two six-cylinder cast-iron engines, both with a displacement of 195.6 cu in. and designed for regular grade fuel, are offered on the Rambler American. The American Deluxe and Custom models are equipped with the Super Flying Scot L-head engine, developing 90 hp, as standard equipment. The 400 models are powered by the Custom Flying Scot overhead valve engine, developing 125 hp, as standard. The latter engine is offered as an option on both Deluxe and Custom models.

Road clearance on the American for 1962 has been increased a full inch, giving it a clearance of 6⅜ inches. ■



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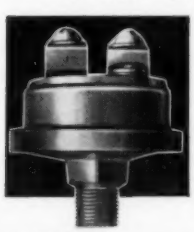

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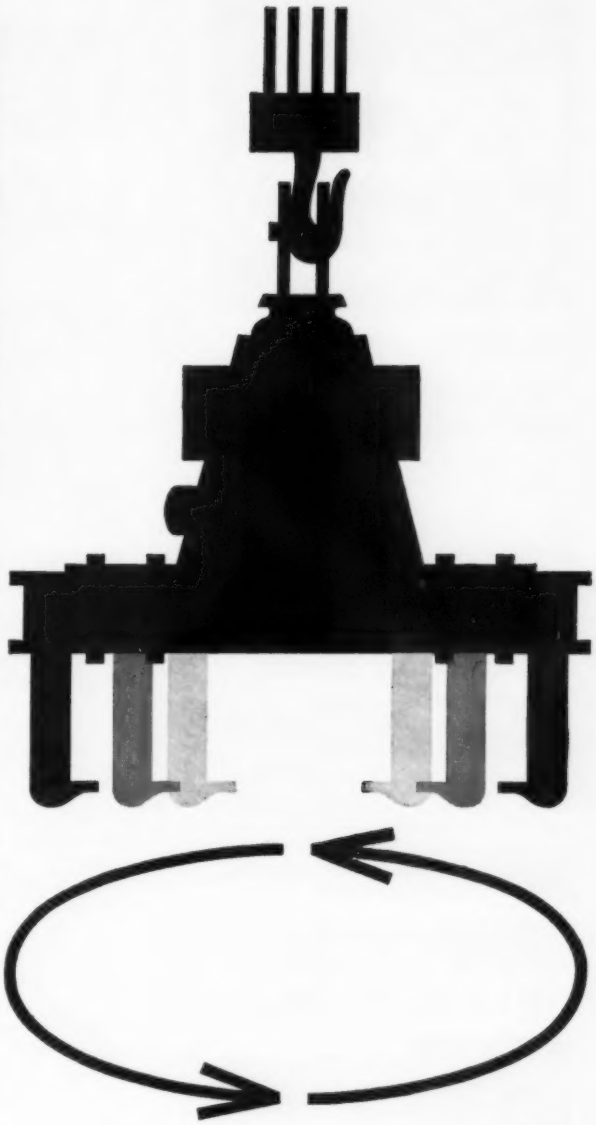

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By C. J. Kelly
ASSISTANT EDITOR

Welding Film 1

A new 16 mm color-and-sound motion picture, "How to weld T-1 Steel," is available for group showings. Produced especially for training purposes, the 18 minute film will be particularly to shop and field welding crews, welding trainees and students. *U. S. Steel Corp.*

Silicone Rubber 2

A new and revised guide on the use of RTV (room temperature vulcanizing) liquid silicone rubber for model reproduction and plastic tooling is available. Designated CDS-191, this eight page publication is complete with step-by-step details on the use of RTV silicone rubber as a molding material. The booklet is well illustrated and includes two pages of money-saving ideas on mold-making. *Silicone Products Div., General Electric Co.*

Precision Gages 3

A complete catalog features an entirely new line of transistorized, precision, low-cost gaging instruments. Included are amplifiers, height gages, bench comparators, dice thickness gages and heads. *Techni-Rite Electronics, Inc.*

Fume Control 4

How to control electric furnace fumes is explained in a new six-page bulletin. Detailed photographs and sketches show how a new exhaust hood, combined with a synthetic-fabric dust collector, eliminates furnace smoke and fumes. Factors enabling this system to operate efficiently even during oxygen lancing are also discussed. *Pangborn Corp.*

Lubricants 5

A 16 page brochure outlines a complete line of industrial lubricants and a program to streamline industrial lubrication as well as cut costs. The publication gives the characteristics and purposes of more than 60 different kinds of industrial lubricants. These are explained in detail. *Pure Oil Co.*

Test Method 6

A new test method has been developed for tensile impact energy to break plastics and electrical insulating materials. A free reprint discussion this method has been published by the American Society for Testing Materials. *Testing Machines Inc.*

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A new 34 page brochure illustrates and describes a line of tube production equipment, in all phases, coil handling, strip joining, strip guiding, strip forming, tube welding, oil cooled rotary transformer, tube finishing, tube cutoff, pipe mills, allied equipment and replacement rolls. Tube welding mills are available in 5 standard series. *McKay Machine Co.*

Expanding Mandrels 8

An 8-page catalog describes a complete line of precision expanding mandrels. The catalog describes a wide range of mandrel styles and sizes — from drawbar and thread-operated types for holes up to 18 in. in diameter through ring-sleeve and PB type mandrels for holes as small as ¼ in. Detail drawings and complete dimensional specifications are given to help users select the right mandrel for any application. *Erickson Tool Co.*

Wet Blasting 9

An informative bulletin, "40 Precision Finishing Operations Where You Can Cut Costs by Liquamatte Wet Blasting," has been issued. The 24-page illustrated handbook shows how and where savings can be made in precision finishing costs through the use of wet blasting. In addition, it describes the way "hand finishes" can be achieved mechanically at low cost in a great variety of production processes, thereby providing a guide with which to analyze finishing operations. *Lord Chemical and Equipment Div., Wheelabrator Corp.*

Wires and Rods 10

A comprehensive catalog (F-1486) of Oxweld electric welding wires and rods describes the various wires for all continuously-fed electrode welding processes, such as submerged arc, mig and CO_2-flux, and wires and rods used as filler metals for tig welding. The guide lists available forms, sizes, packages and chemical compositions. New catalog details the recommended welding processes and Oxweld wires and rods to meet various AISI, AMS, ASME, AWS (ASTM), Federal and U. S. Department of Defense (including MIL) specifications for electric welding of aluminum, copper, aluminum-, phosphor- and silicon-bronze, carbon steel, stainless and alloy steels. A special table covers process and application data, including physical properties of the weld metal, for the ten most-frequently-used carbon steel wires and the steels to which thye are applied. *Linde Co., Div. of Union Carbide.*

Electric Motors 11

A six-page bulletin describes a full line of a c general purpose integral horsepower motors. The bulleting contains selection and specification tables, mounting-arrangement drawings, speed-torque curves, principal dimensions, and pictures a number of "specials" illustrative of designs already developed for special uses in addition to the standard general purpose listings. All 3-phase open motors are available with built-in inherent protection against burn outs, U/L approved. *Kingston-Conley, Inc.*

Pump Bulletin 12

Just released is an eight-page brochure on centrifugal pumps designed especially for corrosive service. The manufacturer says these pumps can handle most corrosive solutions from aluminum chloride to zinc sulfate due to a variety of special pump linings compounded and molded in its own plant. Complete performance curves and other technical data are found in illustrated bulletin number 301. *Industrial Filter & Pump Mfg. Co.*

Dust Control 13

A number of effective methods for controlling industrial dust and fumes are described in a new 20-page bulletin 922A. The bulletin is prefaced with a short non-technical explanation of the advantages available through proper dust control, and lists the basic essentials comprising a typical dust control system. Various collectors are described and illustrated with photographs and line drawings. Included are the new electric furnace exhaust hood and the "CO" cloth tube collector which is proving most effective for high-temperature, corrosive-gas applications. *Pangborn Corp.*

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Heat Exchangers 14

A standardized line of removable tube bundle heat exchangers having an externally packed floating head of improved design is described in a new 6-page folder. Cut-away photographs and cross-section drawings show important construction features, including double "O" ring seal protection which is standard on type OP units with shell diameters from 6 through 16 in. Sizes, dimensions and other specifications are covered. *Basco, Inc.*

Tape Selection 15

"How to Select a Pressure-Sensitive Tape" is the title of booklet DB-56A, which contains a wealth of interesting and valuable information on types of tapes available, how they are constructed, and the factors involved in choosing a particular tape for a specific application. The contents of DB-56A include an introduction that discusses factors influencing choice of a tape, a section defining what a P-S tape is and how it is constructed, a full page devoted to trouble-shooting problems concerned with tape failures, and a glossary of terminology applied to tapes. *Johns-Manville.*

Roll Feeds 16

Catalog number 500 describes new cam indexed camtrol roll feeds for precision feeding of dynamically controlled roll and strip stock at rates exceeding 3000 ipm. Data includes graphs for determining operating speeds and formulas for analyzing machine dynamics, selecting the proper acceleration characteristic and determining correct roll pressures. Specifications of standard roll feeds for stock up to 12 in. wide, and feeding in varying increments, are given. *Ferguson Machine Co.*

Steel Shelving 17

The assembly features, component parts and practical advantages of the three basic types of steel shelving are described in a comprehensive new 36-page catalog. Discussed and pictured are two types of adjustable shelving (Erectomatic and Erectomatic Clip-Type) as well as Fixed Type shelving—complete with how-to-plant and how-to-order information. Photographs of a variety of installations show the many uses and space-saving advantages of each type, plus specially engineered units such as double-deck shelving that puts to work all usable cubic plant space. *Standard Pressed Steel Corp.*

Grinding 18

A new catalog discusses advanced equipment and methods for performing form relief grinding on a variety of cutting tools. Set-up and operation of the fixture and grinder are explained with diagrams and photographs. The catalog also contains complete descriptions of all accessories offered to expand on the usefulness of R-O equipment, such as the optical comparator and high speed spindle attachment. Please write on company letterhead to: R. O. Mfg. Co., 31171 Stephenson Highway, Madison Heights, Mich.

Packings 19

New 16-page catalog illustrates and describes a complete line of pneumatic and hydraulic packings, and also serves as a design handbook and guide. It covers the various types of packings (cup, flange, "U," Vee, "O" rings, back-up washers, one-piece double-acting piston cups, and double-lip shaft wiper seals). Also included is comprehensive information on the various materials, conditions of operation, typical design application, specifications, and data charts on packings in standard sizes. *Chicago-Allis Mfg. Corp.*

Ceramic Gating 20

Ceramic gating components are covered in a 7-page booklet. Included is the newly developed choke bushing designed for simplified reduction of diameters, as well as the new sweep ells, 30 deg angle sections for intermediate radius sweeps, tuyere tubes, 45 deg cut tubes, and pouring basins in round and rectangular entry types. All pertinent dimensions are tabulated for each component; standard package quantities and weights are provided; and rates of metal delivery are charted for strainer cores in lb/sec, as well as cubic in/sec as a function of head pressure. *Universal Clay Products Co.*

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Steel Flooring 21

Three thicknesses of raised lug pattern steel plate for use as safety flooring material and in other applications are described in a new 8 page bulletin. Weights, sizes, safe loads, fabricating and installation instructions are included. *Joseph T. Ryerson & Son.*

Milling Machines 22

Complete specifications are covered in a new 20 page booklet. Included are construction details, operation and optional equipment. The machines are available as either plain or universal type machines and have three hp spindle drive motors. *Brown & Sharpe Mfg. Co., Machine Tool Div.*

Measurement-Control 23

A new 12 page catalog covers a complete line of instrumentation for the measurement and control of surface roughness. Detailed descriptions and specifications together with over 37 reproductions make this catalog ideal for a reference guide for inspectors, engineers, quality control people, etc. *Micrometrical Mfg. Co.*

Soluble Oil Mixer 24

Two-page bulletin explains how the Force-Flo Soluble Oil Mixer inserts into a drum to mix soluble oil and water in the proportion required. *Force-Flo, Inc.*

Press Brakes 25

Design details are presented in a new 12 page booklet which covers specifications for junior and intermediate size mechanical press brakes. Three series with capacities of 50, 65 and 90 tons are described. Bed and ram lengths range from 72 to 168 in. *Verson Allsteel Press Co.*

Thermocouples 26

A newly revised 40-page illustrated catalog provides specifications and a new price schedule for a complete line of general-purpose and special-use thermocouple assemblies and the components thereof. Some new materials are included, and detailed application information is offered. *Minneapolis-Honeywell Regulator Co.*

Ceramic Structure 27

A new brochure on Cercor, a thin-walled cellular ceramic structure developed for varied high-temperature uses, has been issued. The six-page bulletin details product properties and provides information on several applications: in heat exchangers, gas-fired infrared burners, entrainment separation, and as a catalyst support. Liberal use is made of charts, graphs and photographs. The bulletin also contains useful conversion values. *New Products Div., Corning Glass Works.*

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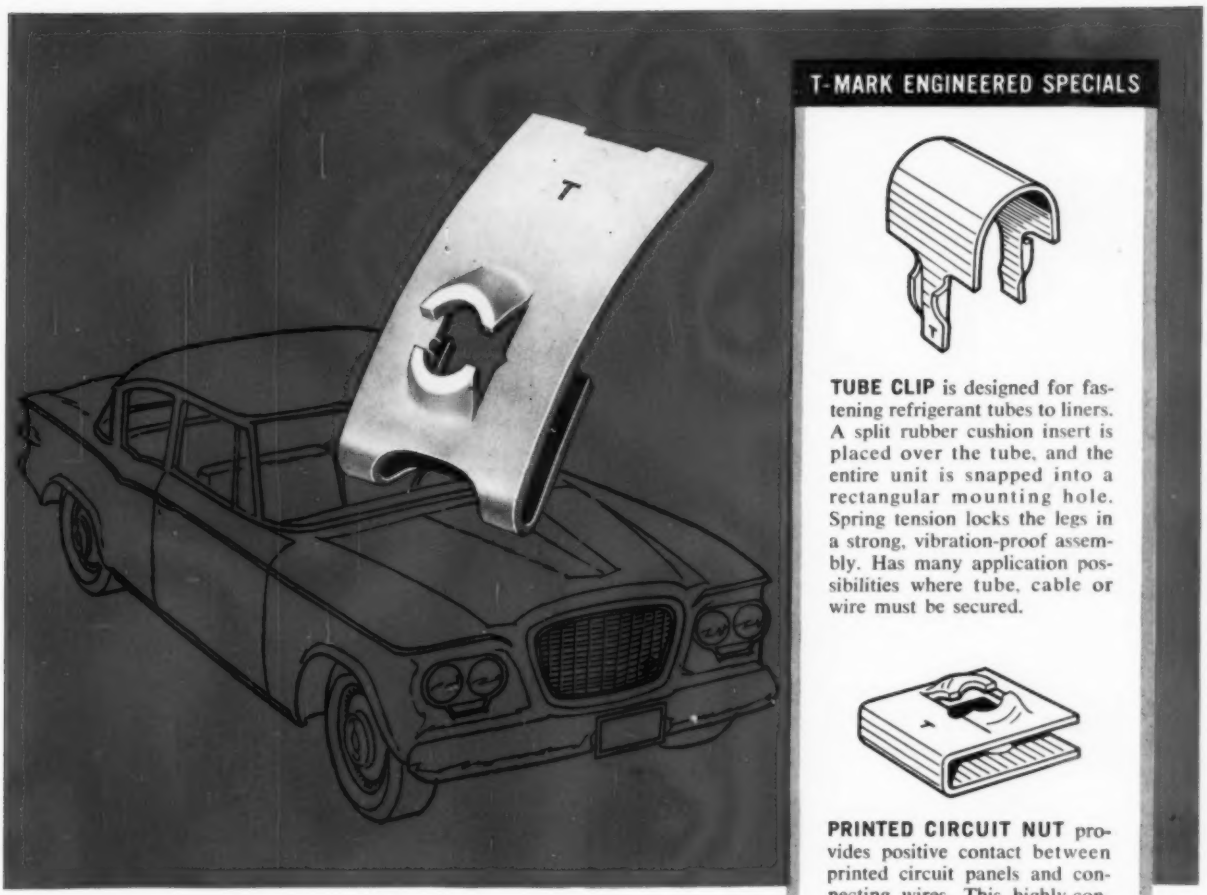

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Preassembled to the Lark's rear quarter panel, the J-nuts hold themselves in place while the panel is first attached to the chassis. The fender is then positioned on the quarter panel and the acme bolts driven home.

In applications like this—where *total* fastener reliability is vital—Tinnerman SPEED NUT brand fasteners are your only choice. Only Tinnerman maintains *total* quality control from coil strip selection to finish coat. The Tinnerman T-mark on every fastener is your assurance of that quality.

For samples, literature, prices, call your Tinnerman sales office ... listed in the "Yellow Pages" under "Fasteners." Or write to: *Tinnerman Products, Inc., Dept. 12, Box 6688, Cleveland 1, Ohio.*

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TUBE CLIP is designed for fastening refrigerant tubes to liners. A split rubber cushion insert is placed over the tube, and the entire unit is snapped into a rectangular mounting hole. Spring tension locks the legs in a strong, vibration-proof assembly. Has many application possibilities where tube, cable or wire must be secured.

PRINTED CIRCUIT NUT provides positive contact between printed circuit panels and connecting wires. This highly-conductive, phosphor bronze fastener snaps firmly over terminal area, allows wiring connections to be made at any station on the assembly line. A screw through the eyelet wire completes the assembly. Easy to assemble ... easy to service.

RUBBER STRIP FASTENER locks bumper strips on a famous-name vacuum cleaner, can solve rubber-strip fastening problems in many fields. This SPEED NUT brand fastener is simply pushed over one end of the bumper strip. Triple-tooth prong secures strip firmly while bumper is wrapped around cleaner base and anchored with identical fastener. No special tools required.

CANADA: Dominion Fasteners Ltd., Hamilton, Ontario. GREAT BRITAIN: Simmonds Aerocessories Ltd., Treforest, Wales. FRANCE: Simmonds S.A., 3 rue Salomon de Rothschild, Suresnes (Seine). GERMANY: Mecano Simmonds GMBH, Heidelberg.

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The new Shuler 20-L axle is a major breakthrough in weight-saving. It embodies a completely new engineering approach, a specially-designed steel and five years of research and development. Each axle saves you 50 pounds – 100 pounds per tandem!

I Estimate the value of this new axle – *in actual dollars that you yourself can make or save* – by doing a little figuring with the chart at right.

100 lbs. more per load on every tandem trailer trip may easily mean *thousands* of dollars to you every year. Figure it out – then specify Shuler 20-L axles on your next trailer order.

Material Hauled	Additional Gallons with 20-L Shuler tandem axles instead of conventional 20,000-lb. axles
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Carbon, dry	6
Cement, dry	10.5
Coke, dry	12
Lime, dry	14
Loam, dry	12
Naphtha	14
Oil, cotton-seed	13
Oil, lard	13
Oil, linseed	13
Petroleum	14
Salt	6
Sodium	13
Sulphur, dry	7
Tar	12
Water	12

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